INDIA RUBBER WORLD AND ELECTRICAL TRADES REVIEW

Published on the 10th of each Month by

THE INDIA RUBBER PUBLISHING CO.

TIMES BUILDING, NEW YORK, U. S. A.

JNO. R. DUNLAP. H. C. PEARSON.

Vol. 14. MAY 10, 1896. No. 2.

SUBSCRIPTIONS: $3.00 per year, $1.75 for six months, postpaid, for the United States and Canada. Foreign countries, same price. Special Rates for Clubs of five, ten or more subscribers.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft, Post Office Orders or Express Money orders on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Post order, payable as above.

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Entered at New York Post Office as mail matter of the second-class.

TABLE OF CONTENTS.

Editorial: PAGE.

The Advance in Rubber ... 223
Another Word About Patents ... 224
Sound Sense on Guarantees ... 224

Notes on Rubber-Conveying Belts and Their Use ... *Thomas Robins, Jr.* 225
Artificial Legs and Arms of Rubber ... 228
Shoe-Lasts and Boot-Trees for Rubber Footwear ... 231

New Goods and Specialties (*Illustrated*):

The "Uncle Sam" Puncture Proof Tire ... 233
A Hard Rubber Test Case ... 233
Semibronze Packing ... 233
The "Volt" and "Trim" Tires ... 233
Another Rapid-Flow Syringe ... 234
Aetna Lawn Sprinkler ... 234
The Erickson Tire ... 234
Seamless Shoulder Gunning Coat ... 234
Temporary Tire Repairer ... 234
Double Clinch Hose-Band and Mender ... 235
Bailey's Rubber Nose-Guard ... 235
Florists' and Gardeners' Atomizer ... 235
The Velvet Molded Hose ... 235
The Crank Bicycle Pump ... 235
A New Foothold ... 235

Brief Abstracts of Recent Rubber Patents ... 236
Recent Deaths in the Rubber Trade (*With Portraits*) ... 238
Heard and Seen in the Trade ... 241
New Trade Publications ... 243
The Rubber Situation in Madagascar ... 244

Miscellaneous:

One Hundred Cents on the Dollar ... 230
Root-Tapping in Assam ... 230
Gustav Mann on Rubber-Cultivation ... 232
Hard Rubber in Fountain-Pens ... 232
The Adamson Screw Press (*With Illustration*) ... 237
Mr. Faber's Liability ... 237
Affairs of the Boston Rubber Co. ... 239
The Factories of the Conant Rubber Co. ... 240
A New Use for Atomizers ... 240
Colonel Theodore A. Dodge (*With Portrait*) ... 242
A Town Divided Over Rubber Boots ... 243
Mineral Rubber Again in Evidence ... 245
Mammoth Deals in Tires ... 245
The Cause of Dull Times ... 245
Cultivating Mangabeira Rubber ... 246
Rubber Trees in Cuba ... 246
Is Not in the Trust ... 246
Rubber Footwear Exhibits in London ... 246
Growing Rubber in Florida (*Illustrated*) ... 247
Rubber Supplies for the Government ... 247
Dame Rumor at Fault ... 248
India-Rubber Interests in Germany ... 248

Trade and Personal Notes ... 249
Review of the India-Rubber Market ... 251

THE ADVANCE IN RUBBER.

IT is an axiom of the trade that whenever crude rubber goes up, it is sure to come down again. But after such a marked advance as has occurred recently the most optimistic manufacturer is apt to be concerned about the date for a decline. The situation is that there is a definite amount of Pará rubber visible, less than usual at this time of the year, with no more forthcoming until the beginning of another crop. The problem is, who will be obliged to buy rubber, and how much?

The shoe-factories are usually supplied ahead with rubber, and nothing in the present conditions of the trade warrants such activity as would make them liberal buyers of material soon. The same is more or less true of the mechanical goods trade. Certainly manufacturers who are short of rubber will not buy at present prices to make goods to fill their stores, and prudence would deter them from pushing the sale of products for which rubber had to be bought at the top of the market. The chief activity in the rubber industry just now appears to be in tires, but here even the best-informed operators are at sea as to the requirements of rubber for the remainder of the season. It may be said to rest with this class whether the consumption of rubber for the summer months will be so great as to cause a greater advance, or so limited as to permit the market to become easier.

In the crude-rubber market the existence is denied of all speculative element farther than is involved in the very nature of buying commodities with a view to their sale at a profit. Leading manufacturers seem disposed to concede this, so that there is room only for the inference that the rate of the world's consumption has really exceeded that of production, despite the largest output for a year yet known. In the United States there are indications in abundance that the volume of rubber-manufacture has been maintained, without taking tires into account. One leading concern assures us that within a year past they have made more goods than in any similar period before, while other companies report having at least kept up to their former figures. There are reports, too, of a large production of goods in Europe, and especially of an increase on the continent, showing that consumption is not to be judged alone from the conditions of American manufacture.

Doubtless there will be more talk of advancing the prices of some classes of rubber goods, but concerted action will be less enthusiastic on account of the failure, practically, to maintain the 10-per-cent. advance on mechanical goods of December last, and also because the proposed arrangement as to guarantees failed even of adoption. Meanwhile the manufacturer whose drying-room is well stocked with rubber can afford to feel comfortable. But the one who is in the best position of all is the one who has based the prices of his products upon the average cost of rubber during a long term of years, and who has refused to make heavy cuts when rubber happens to fall below the average, simply for the sake of a larger showing of sales than his competitors.

ANOTHER WORD ABOUT PATENTS.

RECENT articles in our pages on the unsatisfactory conduct of the patent business by the United States government have been noticed at some length in *Electrical Engineering* (Chicago), which evidently means to defend the patent-office and its methods against all criticism. What we have had to say about patents has been based upon facts which could readily be substantiated if we supposed a majority of our readers to care for an extended discussion of the subject. But we assume that those of our patrons who are inventors do not need any facts beyond their own experience to convince them of the unsatisfactory manner in which our government *secures* to inventors the *exclusive right* to their discoveries. We refer to the matter once more, however, to point out that our contemporary practically admits our original contention when it acknowledges that inventors really do not "get all the protection they are entitled to," and then goes on to say that—

> the patent may have to go into the court of a judge who knows nothing of this or any other art, and perhaps considers it a matter of pride that he knocks on the head every patent which comes before him.

What avails it, though the patent-office proper should be absolutely perfect, if the system of protecting inventors in their rights involves recourse to the courts, concerning the decisions of which—in any patent case—one of our contributors wrote lately that "one may as safely predict the opinions of an unhatched canary"? It is not strange that the result should be such as to lead Mr. George Westinghouse, Jr., to declare that "patent rights are no longer respected in this country," or that many important enterprises to-day should be based more upon the guarding of unpatented secrets than upon the protection which a patent grants. The courts are as truly a part of our patent system as are the patent examiners, and it is the system as a whole that is under review.

We have just noticed a publication by Colonel Theodore A. Dodge, the owner of the Tillinghast bicycle-tire patents, referring to his advertisement of February last, warning all people not to infringe them. He says:

> At that time possibly few people had ever heard of such a patent, and I doubt if there was any idea in the trade that one existed that practically covered all hose-pipe tires as made to-day. Still, such is the case, if the Tillinghast patent of 1893 be sound. On this last point not even an expert's opinion can be deemed safe, for, of all the devious paths to be trodden in this vale of tears, the most uncertain are to be found in the law courts. The Tillinghast patents may not be good; still they are *prima facie* so until voided by the proper tribunals.

What a game of chance is here! People infringing patents without knowing of their existence, some of them feeling protected by patents of their own. Of course Colonel Dodge believes in his rights, and hopes to win in the courts, but he expects no help from the government in determining what are his rights. If land-titles were of such uncertain character there would be few purchasers of real estate. A contributor to our February issue questioned the honesty of the government's policy in relation to patents. Certainly paying for patent protection is not far removed from gambling.

SOUND SENSE ON GUARANTEES.

IN view of the broad and unbusinesslike guarantees that are demanded and given in the marketing of pneumatic tires, it is refreshing to hear from a manufacturer who refuses to jeopardize his own business and injure that of his neighbors by any such methods. President H. D. Warren, of the Gutta-Percha and Rubber Manufacturing Co., Toronto, Canada, writes:

> Our latest addition has been bicycle work, but this we have handled very gingerly. Some three or four years ago we commenced this line, but when the craze for yearly guarantees came in, we dropped out, believing that it was not sound business, and not desiring to be rich one day, with the apparent profits on big contracts for tires, and poor another day when carloads should be returned under the yearly guarantee. Our position regarding that has always been that it was doing business on false lines to give a yearly "road" guarantee, and that sooner or later it would adjust itself, and give way to a reasonable manufacturer's guarantee, covering defective material or workmanship. That change has been gradually taking place, with the result that we built an addition, and equipped it for bicycle work, and since its inception have been doing a very snug business in that line. It takes nerve to let thousands of dollars worth of business go by you unchallenged, but we are old fashioned enough to believe that no amount of business is worth having, which is not on sound lines, and we think it ridiculous to be asked to keep replacing tires for a year, when most of them have undoubtedly been destroyed by accident pure and simple.

THERE MAY BE MORE CHANGES in the board of directors of the United States Rubber Co., at the approaching annual election, than have been customary, and it will be interesting to see who are to take the places of certain directors whose retirement is looked for. While guarding against outside competition, it seems that the big combination has not protected itself against the retirement of any member who may become dissatisfied, and his active opposition thereafter. The great consolidation in the English tire trade, just being perfected, is planned upon a very different basis, in that the competitors whose business has been combined sold their interests outright for cash, and are now out of the field. The new concern over there starts with a management composed of elements which have never antagonized each other, and it will be watched attentively, no doubt, from this side of the ocean, to see whether this way of doing things proves better than the American way.

A GOOD MANY BUSINESS MEN are likely to spend much time and effort, and some money, during the next few months, in the advocacy of a government department of manufactures and commerce. If they think that a member of the president's cabinet, on a salary of $8000 a year and worried almost to death over the choice of his subordinates, can do more to make the business of manufacturing in this country profitable than the people already in charge of that business, they certainly ought to urge the creation of the new department. But we are glad to see that at least our rubber-men have not made any such confession of weakness.

AT THE NEW PLANT of the Kokomo Rubber Co. (Kokomo, Ind.), natural gas is used, the engineer running the boilers as well as the engine. The cost of this ideal fuel for all the work in the factory is but one dollar per day.

NOTES ON RUBBER CONVEYING-BELTS AND THEIR USE.*

By Thomas Robins, Jr.

ABOUT six years ago the writer had occasion to visit a large magnetic iron-ore concentrating-plant, and then saw for the first time rubber belts being used for conveying purposes. These belts were from 20 inches to 30 inches in width, and some of them were as long as 500 feet between centers. When I spoke of the enormous amount of material they handled with a small expenditure of power, the superintendent assented, but at the same time complained that although he bought the best quality of belts, the abrasion of the ore wore them out very rapidly, causing continually very large bills for repairs and renewals.

On close examination several interesting points were discovered:

1. It was noticed that the thin layer of rubber which covered the belt resisted the abrasion much longer than did a corresponding thickness of the cotton duck which formed the body of the belt; in fact, the life of the cover represented about one-half the life of the belt, although forming less than one-fifth of the total thickness.

2. Each layer or ply of duck wore out more quickly than the one preceding it, showing that the fibers were cut more easily when under tension, and, of course, the tension on each fiber increased as the number of fibers bearing the tensile strain diminished.

3. The wear was greatest in a line along the center of the belt. Frequently this part would be so quickly destroyed as to cause the belt to split in two longitudinally, though at the same time the portion nearer the edges was almost as good as new.

Noticing these facts, it becomes obvious that the functions of the cotton duck should be solely to give the belt tensile strength, and that it ought to be so protected by some abrasion-resisting cover that it would not be injured by contact with the material conveyed. It is also evident that this protecting cover ought to be of extra thickness over the center of the belt, in order to stand the harder work forced upon that part. Being engaged then, as now, in rubber manufacture, it was a simple matter to make a belt with a heavy rubber cover on the carrying side and thicker in the center than at the edges.

This reinforced cover renders the resistance to wear equal in all parts of the belt, and although being merely the anticipation of a patch, like the brass toe-cap on the schoolboy's shoe or the two ply seat in his trousers, it was, like them, deemed patentable.

The ideal conveying belt would be like the celebrated "one hoss shay," which disintegrated so evenly and completely when its work was done that there was nothing left to repair or regret.

Wishing to ascertain what particular compound of rubber would make the most durable carrying-surface, I made a lot of small samples, each mixed differently, and exposed them to a very powerful sand-blast, which in its effect approximated the conditions to which the compound would be subjected in actual use, but it was more convenient for a large number of tests, being much quicker. The result of the first series of experiments indicated what grades of gum and what adulterants had better be left out, and also showed something that was very gratifying, namely, that there were certain adulterants which could be used in sufficient quantities to bring the cost down to a reasonable figure. I then made a second set of samples, following in the mixture the formula used in the more successful ones of the first set, but each new one was an attempt to improve upon its prototype. Some of the samples, owing to more intelligent methods in mixing them, proved so durable that the sand-blast test became too tedious, and a more severe and expeditious one was needed. This was found in exposing a disc of the rubber 6 inches in diameter by ½ of an inch thick to a heavy falling stream of crushed ore. The ore averaged about ¾ of an inch in size, and was delivered in a compact and heavy stream from the end of a very fast-moving belt. The sample was so fastened to a board as to receive the whole stream of ore and immediately deflect it. In this way the rubber came in contact with 200 tons of ore per hour, of which each fragment was delivered with considerable force full upon it. At first it was easy to see the comparative loss of weight after the sample had been exposed to the ore for an hour or two. In the next series results were very apparent after a day's run, but later, as results were developed which I was willing to accept as final, it became necessary to weigh each disc before and after the exposure, and thus learn the percentage of loss. The figures relating to the last set of compounds are as follows:

SAMPLES.	Weight before Test in Grammes.	Weight After Test.	Percentage of Loss.
No. 154..... ...	103	102.7	.0029
No. 155	140	138.9	.0078
No. 156.....	134 7	132	.0164
No. 157..... ...	116.7	113 8	.0257

This test lasted for 12 hours' steady running under the conditions stated above.

Having at last decided upon the proper compound for the carrying-surface, I applied it to the belts, and I may say that every belt made since that time, which was in 1892, is in good order to-day. In cases, too, the belts which they replaced had been completely destroyed in three months' time under exactly similar conditions.

There are four principal methods of supporting conveying-belts.

First we will consider the oldest method, in which the belt lies flat upon a straight-faced, horizontal pulley. On account of the liability of the material to roll off the belt, this form is only suitable under certain conditions. The belt cannot be heavily loaded, and the feed must be so regulated that an even amount may be delivered to it at all times. If the material is below ¼-inch in size, the speed may be as high as 300 feet per minute. In carrying larger stuff on flat belts the speed must be lower; but the most necessary thing is to keep the belt very tight, that the material may not be jarred off in passing over the idler pulleys. This, of course, increases the strain on the bearings, and from that fact, together with their low efficiency compared with systems to be described later, we may consider flat-running belts as being out of date.

The second method is somewhat like the first, but with the addition of skirt-boards at the sides to increase the capacity of the conveyer.

This method of rigging belt-conveyers is in great vogue among brick-makers and others who handle clay. It will be easily seen that the material must collect between the skirt-boards and the belt, and that, as it hardens, it will cut a strip

*From a paper read at the February, 1896, meeting of the American Institute of Mining Engineers at Pittsburg, Pa.

off each side. The common practice is to start with a wide belt, and move the skirt-boards in as fast as these strips are cut off. When the width is so reduced as to render the conveyer totally useless, wheelbarrows are called into play until a new belt can be procured, and the entire process recommenced. This method is so entirely bad, that I refrain from further description. It is only fair to say, however, that the skirt boards fill one useful purpose, as it is the practice of the men shoveling into the belt to rap their shovels against the boards in order to get rid of the sticky clay. A board for this purpose can be applied, however, to a much better form of conveyer, and in such a way that it cannot interfere with the belt.

The third method is a slight improvement upon the last, in that a trough is made by raising the sides of the belt instead of using boards as described above.

This method has an obvious fault, owing to its bad design. By reason of the difference between the two diameters, the outer edge of the pulley goes twice as fast as the inner edge. This causes a slip which soon wears out the under surface of the belt. For belts not wider than 14 inches this form is not bad, for, with small belts, the weight on the pulleys is light, and the effect of the slipping is less severe.

The fourth, and best form of belt-support, is composed of three pulleys, one carrying the middle or bottom of the belt, and one on each side with its axis at an angle of about 45°. The shafts of all three pulleys are held in a pair of combination bearings which can be adjusted to different widths of belt. I never supply any other form of support for belts wider than 14 inches, and when I refer to troughed belts in this paper it is to be understood that the sides are raised by means of these angle-pulleys.

There has been no mention hitherto of the means of supporting the empty part of the belt on its return. This is done by a single flat pulley, or with a pair of smaller pulleys with an interval between them.

It is sometimes possible to save money in constructing a long conveyer by combining the first and last methods of belt-support referred to. If the belt were run flat the whole distance, it would need to be so wide that the extra cost would be about equal to the money saved in using the cheaper flat form of pulley; but by placing a set of troughing pulleys between every fourth and fifth set of flat pulleys, or at such other interval as may be found advisable, the load is so centered at each of these points that it has no time to overflow before it is again centered between the next pair. In this way the use of a very wide belt is unnecessary, but the conditions are not always favorable to this plan.

On some conveyers, it is often advisable to have at intervals a pair of idlers, running on a vertical axis, or inclined inward, so as to make a right angle with the edge of the belt. These will serve to keep the belt straight on the pulleys.

The large pulleys at the end of the belt should be slightly crowned on the face, and the pulleys should not be less than 4 inches wider than the belt. The driving-pulley ought never to be less than 30 inches in diameter, and in the case of long wide belts 48 inches is advisable, as it allows the first return pulleys to be so placed as to give the belt a very large arc of contact on the driving pulley.

Whenever it is possible, it is better to have the driving-pulley at the delivering end of the belt; but, if it must be at the receiving end, a triple set of pulleys connected by gears can be easily arranged which renders slipping impossible with the longest and heaviest loads. I believe that this scheme was first used by Mr. S. H. Edwards, Superintendent of the Magnetic Iron-Ore Co., at Benson Mines, New York.

The proper distance between the sets of idler pulleys is an important factor in the economical running of the belt, as will be referred to later. I believe that the troughing-pulleys should be from 4 to 6 feet apart, according to the weight of the load, and that for the return belt there should be pulleys placed under every alternate set of troughing pulleys which would make the lower pulleys from 8 to 12 feet apart.

To me, one of the most wonderful things in connection with this subject is the exceedingly small amount of power required to move enormous quantities of material. The power required, in one case, to run a conveyer, which carries 1000 tons per day a distance of 180 feet, and elevates it 40 feet while doing so, is all transmitted by a torn and frayed little 5 inch belt, which takes its power from a pulley on the shaft, and transmits it to a pulley alongside the head-pulley of the belt. The power is here divided, part of it going over a sprocket-chain to help drive a large dumping-apparatus. Yet the entire amount of power employed for both purposes does not exceed four horse-power.

I would like very much to give some rule for determining the exact number of horse-power required for conveying-belts running under different conditions, but I find it impossible, owing to the number of variable quantities which make up the load. One of the most important of these points is based upon the distance between the sets of troughing pulleys. If they are too far apart the belt sags down between, which materially increases the load. If, on the other hand, the idlers are too near together, the extra number of bearings makes another sort of resistance to be overcome. No general rule can therefore be made by which the required horse-power can be accurately determined.

It is a simple matter to determine the necessary belt-width and speed to perform certain duty when the weight per cubic foot of the material is known. If the belt is troughed it is safe to estimate that the load itself will cover one-half of the belt's total width, and that the depth in the center will be one-quarter of its own width. The area in inches of a cross-section of the load (which we may consider an inverted triangle) will when multiplied by 12, give the number of cubic inches of material borne by the belt on each running foot of its surface. Multiply this result by some estimated speed to get the quantity in cubic inches that the belt will deliver per minute, and then reduce this to the number of feet, yards, pounds or tons delivered per hour, or to other convenient terms.

Having decided upon the proper width of belting for the duty to be performed the next points to be settled are the proper thicknesses for the belt and for its protecting cover.

The following table shows the suitable number of plies for different widths of conveying belts:

Belts 20 inches wide and less		should be	4-ply.
" 22 and 24	wide	"	5 "
" 26 and 28	"	"	6 "
" 30 to 36	"	"	8 "

The thickness of the rubber cover should be based upon the character of the stuff to be carried. For hard material weighing over 50 pounds per cubic foot the cover should not be less than ¼ inch in thickness. With the patent reinforced cover it is possible to have this thickness at the center where it is needed, allowing it to taper off to $\frac{1}{16}$ inch or ⅛ inch at the sides where the work is lighter. This, of course, makes the cost lower than if the same thickness of cover extended the whole width of the belt. There is now an improved form of this belt which combines the advantages of this thickened cover with stiffened edges which give it such firmness at that part that a mere touch against the steering idlers serves to keep

it running true. This stiffening is done by running two or three plies of duck a part of the way in from the edges, giving all the advantages of a heavier belt but at a lower cost. This form will also be patented.

At the point where a belt receives its load it gets as much wear as it meets with in all the rest of its journey. A few points should be borne in mind in connection with this part of the conveyer. The material should not be allowed to drop vertically upon the belt but should instead be so guided by an interposed chute as to strike the belt with as nearly as possible the same speed and of course, in the same direction as that of the belt itself. This is much the same principle as that which causes a man who wishes to board a fast moving car to run along a few feet before jumping upon the step, except that in the former case it is the wear-and-tear upon the vehicle or belt which is avoided instead of injury to the passenger.

If ore or rock is carried, there is bound to be wear wherever it touches. It is well, therefore, if it has to fall any distance to let its force be broken by striking first against an accumulated pile of itself and then roll off on to a chute, whence it may slide quietly upon the belt and not move until it reaches the end of its journey.

The chute should be made of cast-iron with sides, and should be so wide that the ore or other metal cannot get jammed, as it is very apt to do. The objection to a wooden chute is, that the broken stone or ore does not slide properly upon it, but runs down in a succession of jumps, that are as apt as not to carry it over the side of the chute or off the belt.

There are many ways of joining the ends of carrying-belts, the most common being by the use of metal belt hooks consisting of a set of teeth cast together with a metal back. These have to be destroyed if the belt needs taking up, and a better plan is this. Thin steel plates are laid upon a strip of thin leather or canvas which covers the opening in the belt and thus prevent leakage. Staples are driven through the holes in the plate and clinched. In breaking the joint the staples are easily cut with a cold chisel but the plates themselves can be used an indefinite number of times. They are the invention of Mr. S. H. Edwards.

The simplest method of lubricating the bearings is by means of compression grease cups which are dust proof and very economical. They are screwed into the ends of hollow shafts and a man without stopping can give the handles a turn as he walks along the belt. This has to be done once a day at most. Grease costing about four cents a pound is generally used.

Some of the purposes for which conveying-belts are used are the carrying of trap-rock and limestone in stone-crushing plants, charcoal and ashes in sugar-refineries, ore in concentrating-plants and mines, earth and stone in large excavations, blocks and logs of wood in pulp-mills, clay in brick-yards, coal in breakers, yards, large power-plants and culm-piles, tobacco in process of manufacture, customers' packages in large retail stores, grain in elevators and flour-mills, boxed goods in coffee-mills, phosphate ore in the southern mines and chemical fertilizer in plants all over the country. These are only a part of their uses, but the list of other purposes for which, though not employed, they are equally suited, and must some day be applied, would be a very much longer one.

Belts generally cost less to install than any link-belt or other metal conveyer; and the cost of maintenance is so much less that there is simply no comparison between them. In addition to this, they run noiselessly, instead of making a perpetual and deafening racket, and no owner's ears can become oblivious to a banging and crashing of which every vibration means wear and depreciation, as well as loss of power.

You may say, "If this belt method of conveying is all that this man claims, why haven't we heard more about it? Why isn't it used more widely?" My answer is this: The various systems of sprocket-chain, metal pan, trough and screw conveyers and the over-head cable-systems have all been owned by manufacturing concerns who make them known by advertising, undertake their construction and installation, and guarantee them. As to conveying-belts, no fundamental patent on the principle could be secured; and because a belt conveyer is composed of two parts which are about equal in value and the products of entirely separate kinds of manufacture (I refer to, first, the iron pulleys and other supporting parts and second to the belt itself), no iron man felt like pushing the sale of a conveyer when he knew that some rubber manufacturer would share equally in the profits, and the rubber man would doubtless have felt the same if, with his less extensive knowledge of machinery, the thought ever occurred to him at all. And so, between them, the belt conveyer has been neglected except where its merit compelled the recognition of a few wide-awake and self-reliant engineers. It has been the property of no one. Nobody's living depended upon its exploitation. It was to the interest of no one to stand sponsor for it; to develop, push it and perfect it. There are no data published about it, and each man who uses it to day is practically the inventor of his own apparatus, which he has brought to its present state only after an expensive and vexatious experience. If an engineer to-day has a conveying problem to solve and the thought of a belt occurs to him, immediately after come the questions: What kind of a belt? What width? How should it be run? On what? At what speed? Where can I find out? Being unable to answer any of these questions, and not caring to try experiments, his natural inclination is to state his needs to the well-known manufacturers of conveying apparatus and make a contract with one of them, thereby shifting the responsibility as soon as possible. The load of responsibility is apparently charged for along with the apparatus, but even the high price of the latter contains no suggestion of the great and continual expense incurred in running and keeping it in order.

I do not wish to appear as condemning universally the use of all metal conveyers, for there are indeed some conditions for which they are better suited than are belt conveyers. I may mention, for instance, places where the point of delivery must be constantly and quickly changed. With iron conveyers this is accomplished by the removal of a section of the iron trough, while a belt requires a moveable frame-work containing two pulleys. This dumping-apparatus can be moved to any point in the belt's length, but it is neither as cheap in construction nor as quick in operation as the plan adopted with metal conveyers.

Nor do I condemn the great ingenuity which has made possible even the *poor performance*, by metal conveyers, of duties for which by their very nature they are unfitted. That is business. I only want to show that there are many places where other conveyers are now used for which belts could be substituted with economy.

The other day a man pointed to what he called a "real conveyer," which was dragging and scraping its load along (and apparently protesting against its own design and unfitness for the task) and observed: "Oh, this does the work cheap enough." It may be cheap, compared with manual labor; but it seems to me that with the competition of the present day nothing is cheap enough if there is anything cheaper. The object of these notes and sketches is to facilitate the use of belt-conveyers. I have gone into details, in order that any one who wishes to do so may construct a suitable conveyer.

ARTIFICIAL LEGS AND ARMS OF RUBBER.

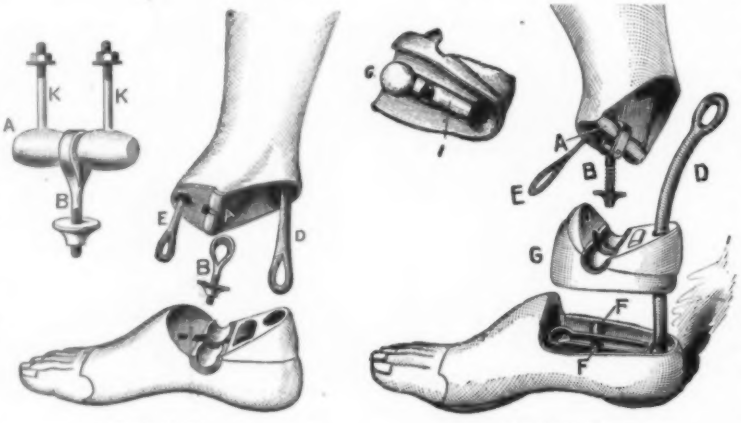
By Gustav Heinsohn.

THE use of India-rubber in the making of artificial feet and hands is regarded by some people as one of the most important of the many ways in which this substance has been brought by surgery to contribute to the comfort and well-being of man. It is probable that the use of some substitute for natural legs and arms dates back to the earliest history of amputation, but the best things of the kind were very crude until within quite recent times. Even now the "peg leg" is sometimes used to replace a lost limb. The literature relating to artificial limbs is scarcely more than a hundred years old, and to this day is confined mainly to papers in the surgical journals and to the advertising pamphlets of manufacturers. Between 1790 and 1800 some improvements in artificial limbs were brought to light in England, and from that time surgeons sought to perform the amputations which afforded the most appropriate stumps for the accommodation of artificial limbs, while manufacturers did what they could to meet the requirements in this field. In the United States a new style of limb (the "Selpho") was produced in 1839, and was followed by occasional competing inventions until the great civil war attracted unusual attention to the subject and brought to the front a large crop of patents. From the beginning manufacturers have been confronted by two serious problems—(1) how to secure the right relation of strength to weight in an artificial limb, and (2) how to imitate the elasticity of the natural foot.

When a man is walking on his natural feet there is a point, in the taking of each step, at which he stands on the heel of the advanced foot and on the toes of the receded foot, and the plantar surface of the advanced foot does not reach the ground until the body is carried nearly over the advanced leg; as soon as the body is over the advanced leg, the heel of the receding leg begins to rise and the force of propulsion is obtained from the toes of that leg. This natural movement in walking has been contrasted with that in walking with an unsatisfactorily-jointed artificial foot, as follows: "Advancing on the artificial leg, he strikes the heel to the ground; the toes almost immediately drop with a thud, and the plantar surface remains on the ground during the entire interval that the body is passing over the foot; the heel does not rise immediately, and the wearer has to exert himself to 'get off' the foot; this exertion is an additional tax; it produces an awkwardness and a limp, and tires the wearer more than any other feature of the leg."

The difficulty which exists here has been recognized by all the manufacturers. As one of them says in pointing out what an artificial foot should be: "A person must be able to raise his entire weight on the ball of his foot and elevate the heel in order to walk naturally, easily, quickly, and helpfully; if the artificial foot has an ankle-joint that will not enable him to rise on the ball it becomes a worthless appendage, hindering in all its operations." The first endeavor of the makers of artificial legs was to fashion an ankle-joint which would simulate the action of the natural foot. When it became recognized that a universal motion, so to speak, could not be obtained from a single joint, a double ankle-joint was produced. But all the various joints involve the use of an array of springs and cords which require adjustment and repairs, and often at a most inconvenient moment. It was in the hope of overcoming some of these difficulties, and of more closely imitating the natural foot, that India-rubber was introduced by certain manufacturers as an important constituent of the artificial foot.

The first India-rubber foot was invented in the United States in 1861 and patented in 1863. It had a "wooden core which was placed in the foot for the purpose of localizing the toe movement, affording the proper degree of compressibility at the heel, and providing a medium for proper connection with the leg. The core was entirely surrounded with sponge rubber, with the greater quantity at the heel and toe. The rubber, being sponge, possessed a great degree of compressibility and would yield under the weight of the wearer—so much so that when the weight was applied at the heel, there being a greater quantity of rubber at that place, the compression would be so great as to allow the toe to gracefully reach the ground. At the ball there was less rubber, so that there would be phalangeal support, and the wearer be made conscious that there was something in front of his leg that would support him while standing, keep him from limping when walking, and act as a lever for propulsion when the center of gravity of his body became in advance of the point of contact of the ball of the foot with the floor." A modification of this foot was patented in 1880, the new feature introduced being a series of layers of canvas, attached to the wooden core and extending forward to the ends of the toes, the canvas being cemented to the rubber between the layers.



SINGLE JOINT. DOUBLE JOINT.

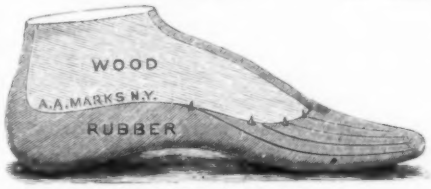
ANKLE-JOINTS IN ARTIFICIAL FEET.

[Illustrations of Patents of C. A. Frees, No. 821 Broadway, New York. The first allows only the backward and forward motion of the leg, while the latter permits of a lateral motion as well. Rubber is used in connection with the tendons, and at *F F*, in the second cut.]

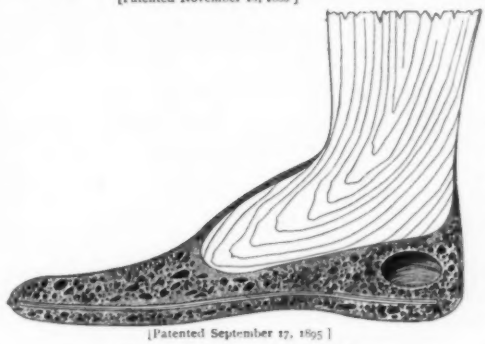
The latest rubber foot patented by the same manufacturers (September 17, 1895) consists of a wooden core, as in previous models, surrounded with sponge rubber of great porosity; a steel spring mattress is molded in the rubber, nearer to the bottom of the foot than to the core, and extending from the heel to the toes; and there is a pneumatic air-space at the heel immediately above the spring. This spring mattress, com-

pletely surrounded by rubber, is intended to provide additional resiliency for both the toes and the heel. The air-chamber in the heel makes the foot at that point more spongy and more yielding under pressure, and as the chamber is surrounded with sponge rubber, there is less danger of its collapsing should the walls become punctured. A point constantly aimed at in the manufacture of these feet has been to avoid wholly everything in the shape of an ankle-joint, the India rubber being relied upon for all the elasticity needed. The yielding quality of the rubber will also admit of a lateral ankle motion, so that the foot will accommodate itself to an incline, for instance, when placed sidewise upon it.

[Patented December 1, 1863.]



[Patented November 16, 1880.]



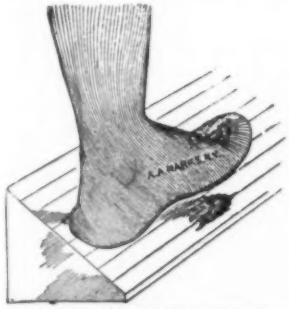
[Patented September 17, 1895.]

EVOLUTION OF A RUBBER FOOT.

[Three successive steps in the development of the rubber foot invented by A. A. Marks, 701 Broadway, New York. The cuts show the wooden core, surrounded by sponge rubber.]

Another large manufacturer had patented in 1891 a rubber foot based upon the idea that the others in the market were too stiff, while the ankle-jointed feet had too much action and too little elasticity, and were too complicated in manufacture. The article which he offers as a compromise may be described as having two wooden cores hinged together, with a rubber cushion between them the whole being enveloped in sponge rubber. The operation of this device is that it bends in walking where the bend is supposed to take place in all natural feet. For the purpose of strengthening the foot some plies of canvas are introduced near the bottom, from a point near the outer end of the toes, round the heel, and a few inches up the ankle. The advantages claimed are (1) that the hard, thumping sound of wooden feet is done away with; (2) that the leg is relieved from unpleasant jars in walking; and (3) that the elastic action of natural foot is imitated.

One of the oldest artificial legs in the market, while retaining the wooden feet, with their ankle-joints, is now provided with India-rubber cushions in combination with the joints, to lessen concussion and prevent the clapping sound of the feet against the ground. Still another manufacturer, in order to give elasticity to the artificial tendon known as the "heel-cord," has placed a piece of rubber at its upper end, with a view to its becoming compressed enough to impart an easy and life like step when there is a strain upon the cord. It has even been attempted to substitute India-rubber bands for these tendons, in the interest of elasticity, but the rubber has not proved strong enough.



LATERAL MOTION OF A RUBBER FOOT.

[Illustration of effect of stepping upon an inclined plane.]

The manufacture of rubber hands has proceeded upon entirely different principles, but the details are too intricate to be described in a single article. It is only necessary to say that since the introduction of the use of India-rubber more satisfactory results have been attained in the making artificial hands, with respect both to their appearance and their utility. By the way, while the loss of arms is as frequent as the loss of legs, the substitution of artificial ones is less general. The books of one manufacturer show that 85 per cent. of the orders received were for legs and only 15 per cent. for arms.

In the development of the manufacture of artificial limbs American houses have led the world, and for some years past there has been a considerable export trade in such goods from this country. The walls of the offices and showroom of an important manufacturer in New York are covered with the envelopes of letters received from customers in almost every country in the world, bearing the post-marks and stamps showing the countries whence the letters came.

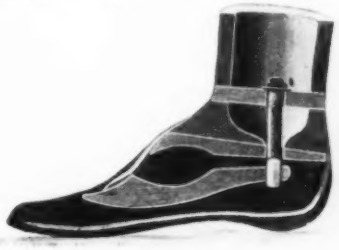
The United States government, with its accustomed liberality in the matter of pensions, offers artificial limbs to all soldiers and sailors who have suffered the loss of arms or legs in the service of the country, or from disease contracted while in the service. Not only are these limbs provided free, with an allowance for their replacement every three years,* but the government will pay for the transportation of the pensioner to the manufactory whenever this appears necessary for the proper fitting of a limb. It may surprise some readers to know that by far the greater number of those entitled by law to artificial limbs elect to receive instead the money appropriated for their purchase—$75 for a leg or $50 for an arm. The government's expenditure for artificial limbs (or money commutation) for a few years selected at random from the records was as follows:

In 1888 89.....	$190,787.27	In 1891-92.....	$360,277.80
In 1890 91.....	515,569 67	In 1892-93.....	125,194.48

The next table shows the small number of limbs actually deilvered to pensioners contrasted with the number of commutations:

	1889-90.	1890-91.	1891-92.	1892-93.
Legs.....	23	513	53	15
Arms.....	3	18	2	1
Hands.....	0	0	0	1
Feet.....	0	0	2	0
Commutations.....	3651	7790	6385	2688

This showing is eloquent of the poverty of the pensioners as a class, but for which the governmental provision must have led to a large increase in the number of artificial limbs made and used. The ranks of the maimed are steadily reduced by death.



ROWLEY'S RUBBER FOOT.

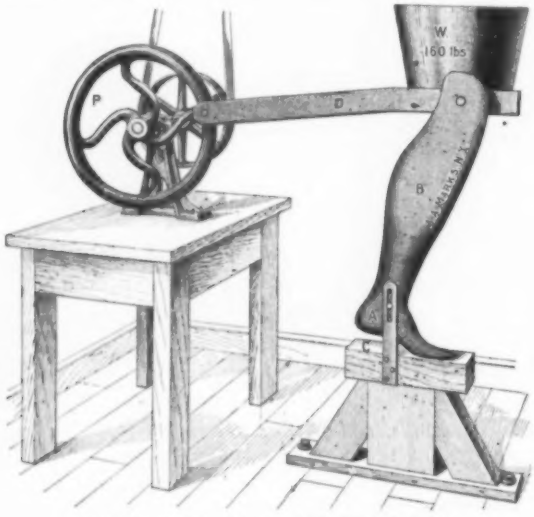
[Manufactured by I. F. Rowley, No. 312½ State st., Chicago, Ill. Patented July 21, 1891.]

*The limit was formerly five years, and the manufacturers assert that eight years are a short term of usefulness for a well-made artificial limb.

According to the records of the war department, the number of soldiers alive at the close of the war who had lost limbs was 13,052. Twenty-seven years later there were on the rolls the names of only 10,187 applicants for limbs, or their equivalent in money. Of these, 5053 had lost arms and 5134 legs. The whole number on the list had used only 4421 limbs since 1872. Doubtless many ex-soldiers receive their money allowance every three years, while continuing to wear an old limb.*

Thirty-eight manufacturers of artificial limbs are under bonds to the government for the guarantee of their goods. The United States surgeon-general reported in 1892: "The care exercised in the manufacture and fitting is such that a complaint of misfit, discomfort, poor workmanship, or inferior materials, is scarcely known in connection with this service." This cannot be construed as a testimonial for any single manufacturer, or any class, since the government shows no discrimination in the matter of the different styles of artificial limbs.

The number of artificial limbs in use cannot be stated. The estimate of a large New York manufacturer is that 100,000 have been made. Of those manufactured in recent years perhaps one-half have rubber feet and hands. The total number of manufacturers of artificial limbs in the United States is nearly a hundred, but most of these, including the majority of those supplying limbs for pensioners, work on a very small scale. There have been 214 patents on legs alone issued in the United States, and 35 patents on arms. Outside the United States the conditions of manufacture of such goods are far less advanced.



MARKS'S DEVICE FOR TESTING RUBBER FEET.

[Designed to subject a rubber foot to the strains and actions that follow its use by a person weighing 160 pounds, traveling on an average of two miles daily for three consecutive years. *A* represents a rubber foot, attached to an artificial leg *B*; *C* represents the surface walked upon; *D* is a lever worked by the power, *P*; *W* represents the weight of 160 pounds. When power is applied, the lever moves horizontally, forcing the leg forward and backward, first with the weight on the ball of the foot, and then on the heel. The guides, one on each side of the leg, perform no function except that of holding the leg in place. The slots prevent any interference with the weight being applied directly on the foot.]

Almost from the time when the sulphur patents were brought out, a demand has existed for what is called "sponge rubber," in making which many methods have been employed. All these methods are based upon the tendency to porosity induced by certain substances when incorporated with India-rubber and vulcanized. In other words, anything in a rubber compound that will generate a gas when heat is applied will render the product more or less porous. One of the earlier attempts to make porous or "sponge" rubber was by the addition of damp sawdust. A better plan is to mix carbonate of ammonia with the rubber, since that, under vulcanization, fills the mass with innumerable minute cells. But ammonia is so volatile that great skill is required to manipulate this kind of rubber sponge, and even the most skilled operator cannot be confident that the same result will always be attained. Under this method the rubber is first run into very thin sheets, sprinkled with the carbonate of ammonia, and folded over upon the carbonate. By pressing the surfaces together the particles are imprisoned which, under heat, are to become gasified. One sheet after another is subjected to this treatment until a block of rubber has been built up. This, when put into the mold, forms the best kind of sponge rubber. It has one troublesome quality, however; unless the stock thus made is used almost immediately, the volatile ammonia will disappear through the pores in the unvulcanized stock.

* A large manufacturer says the government figures do not correctly indicate the number of pensioners wearing artificial limbs, for the reason that many of them prefer to accept money and order limbs without dealing through a government department.—THE EDITOR.

ONE HUNDRED CENTS ON THE DOLLAR.

THE following letter has been sent to Alexander E. Orr, president of the New York Chamber of Commerce, in reference to the disturbing agitation for a debased currency through the free coinage of silver:

SIR: Answering your circular letter of March 5, only just received by us, calling on all concerned to "put a stop," etc.:

Three years and more since we "put a stop," so far as concerned ourselves, by issuing order blanks, bills, statements, and every other document with "payable in United States gold or its equivalent" printed on each and every one of them, by steadily refusing all orders offered with these conditions erased, and by replying to all complaining or abusive letters (they have been numerous) that we desired only orders from people who bought intending to pay 100 cents on the dollar.

If others would have the courage of their convictions we are convinced from our experience that they would find the size of this "bogie" quickly shrink and eventually vanish. We have the honor to be, very respectfully,

MINERALIZED RUBBER CO.,
G.P. Dodge, President.

ROOT-TAPPING IN ASSAM.

MR. SMYTHIES, the officiating conservator of forests for Assam and the central provinces, writes concerning the falling off of the rubber production:

"The Divisional Officer is of opinion that hardly a rubber tree in the natural rubber forests will survive the treatment applied to them during the lease which lasts five years. No supervision was exercised over the tappers, and it is believed that most of the trees have been killed by root-tapping.

"In 1892-93 an attempt was made to work rubber departmentally in the Darrang district, and about 23 maunds of rubber were thus collected. During the year under review, a contractor was allowed to work out rubber from the government forests, on a royalty of Rs. 20 per maund, but he only managed to obtain about 9 maunds. This fact tends to prove that the amount of rubber available in the natural state forests has diminished, and that most of the yield comes from beyond the border.

"The total amount of rubber exported was 3515 maunds and the revenue realized on this same to Rs. 42,225. In view of the prospective death of natural rubber trees within British limits it would seem advisable to extend the very excellent plantation of this valuable tree in the Darrang district, known as Charduar."

SHOE-LASTS AND BOOT-TREES FOR RUBBER FOOTWEAR.

SUCH has been the demand lately for new lasts for rubber shoes, to correspond to the popular narrow-toed styles in leather footwear, that the regular supply has been exceeded, and orders have been placed with outside manufacturers. The extra expense to the rubber trade of this new demand will be so large that it is being quoted as one reason for what is virtually an advance in the prices of rubber footwear this season. It is true that, when bought in quantities, these lasts can be had for 28 cents up to 45 cents per pair, according to size, which would be only $280 to $450 per thousand. But when the great number of lasts needed in the rubber-shoe industry is considered, the total mounts up rapidly.

The fact has to be considered that the number of lasts needed in any rubber-factory is much greater than the daily output of shoes at any time. Suppose that only one style of shoe were made at a certain factory, at the rate of 10,000 pairs per day. More than 10,000 pairs of lasts would be needed, for all the shoes sent to the vulcanizing-room in any day cannot be removed in time to make the same lasts available the next day. Not less than 13,000 or 14,000 pairs of lasts would probably be needed. But a single manufacturer sometimes produces 1200 or more different styles and sizes of rubber footwear during a season. It would not be economical, however, to have all these different styles on one day's "ticket." So a comparatively few styles are selected for each day's work, and there must be enough lasts for these to employ the factory at full capacity, while the lasts for all the other styles remain idle. A member of the trade, speaking for his own company, estimated the number of shoe lasts and boot-trees required to be kept on hand at three times the total capacity of the factory, which would mean 30,000 pairs for every 10,000 pairs of footwear they were prepared to turn out daily. This would represent an outlay of not far from $12,000 for each 10,000 pairs capacity if they were all for shoes, while any boot-trees would increase the average cost.

The great heat to which rubber shoes are subjected in vulcanization—from 230° to 280° F.—renders necessary a special treatment of the wood in the manufacture of lasts, which adds much to their cost. Without this treatment, the lasts would speedily crack and fall apart in use. The lasts are first stored for a few weeks in a kiln or drying-room constantly heated to say 80°, and then removed successively to several other rooms, each under a higher temperature, until they have been subjected to perhaps as much as 300° of heat. They are then in a condition practically to be unaffected by the temperature of the vulcanizing room. In the course of time, however, under the continual handling of the lasts, which gradually become more and more charred, their finer edges begin to wear off, so that a perfectly-shaped shoe can no longer be made upon them. After this wear first becomes perceptible they are first set apart for the manufacture of second-grade shoes and, finally, sent to the scrap-heap. The manufacturer who is careful about the standard of his output will have his stock of lasts inspected frequently, in order that any which have become worn at the edges may promptly be set aside.

With reasonable use maple lasts should be serviceable, on an average, for from fourteen to eighteen months, which is quite as often as a large manufacturer cares to replenish his outfit. Even then the sole patterns must be constantly changed to fit the shrunken edge of the last. But when new styles of shoes are wanted, the lasts on hand have to be laid aside, regardless of their condition, and new ones ordered. Frequent changes of fashion, therefore, make the outlay for lasts a serious item. This fact has discouraged the use of metal lasts in this country for shoes where styles in footwear change more frequently than in England or on the continent, where lasts cast of gray iron are used almost exclusively. This, however, does not hold true with boots and arctics. The first cost of metal lasts is much more than the cost of maple, but this item would be offset by their greater durability, were it not that a sudden whim of fashion might render useless a new and costly stock. An iron last, being annealed, is not worth anything as junk.

The first rubber-shoe lasts were made of clay and used by the native rubber-gatherers on the lower Amazon. While the importation of the primitive rubber shoes to this country was at its height, Messrs. Candee and Hotchkiss, of New Haven, Conn., shipped to Pará a lot of maple lasts better suited to the shape of the feet of American wearers, and these lasts were largely used up to the era of Goodyear and Hayward. Since the development of modern rubber shoe manufacture, Malden, Mass., has become the center of the production of the lasts used. Three establishments at that point are believed to supply the greater part of the demand for maple lasts from the rubber companies. They are known to have made shipments to at least one important factory in Great Britain. One of these concerns has lately become the property of the Boston Rubber Shoe Co., who are thus the first shoe firm to supply their own wants in the way of lasts.

Almost every material that could possibly serve the purpose has been tried for boot-trees and lasts, but wood still has the call. For instance beautiful smooth shoe lasts of glass have been tried, but, as it was impossible to make them tough enough by the most careful annealing, they were found to be impracticable. It was believed that an easy solution for the problem was found in malleable iron until a few hundred pairs of shoe lasts were turned out. These failed, however, because 90 per cent. of them warped across the toes so badly as to be entirely useless for shoe making. Quite extensive experiments have been tried with wood pulp, and very handsome lasts and trees put in the hands of the rubber-shoe manufacturers. Up to the present time, however, they have not been adopted

because once the thin outer shell is chipped, the inside is found to be "punky" and possessed of no durability. A very interesting experiment was tried not long since which consisted in coating a wooden last with copper and different alloys by electrolysis, but for some reason it was found to be unpractical and was not adopted by the parties interested.

One of the latest ideas that only fell a little short of complete success was the "striking up" of lasts and trees out of plate steel. This was done by the use of a series of dies. The trouble here was in forming square edges and in riveting the two halves up with a smooth joint in the finishing. Then too the male and female dies were very expensive, and a special set was required for every style and size. The sample lasts made by this process were beautifully light and but for the objections noted above would have been a complete success.

One of the most interesting of all the attempts to supersede wood has been the employment of aluminum, especially for lasts for arctics, and trees for boots. One of the first theoretical objections to the use of this metal was that, as it is a good conductor of heat while wood is a poor one, it would burn the goods during vulcanization. This trouble, however, was found to exist only in the imagination of the suggester. The goods cured even better than on wood and so much quicker that there was found to be a saving of 25 per cent. in the cost of vulcanization. Boot trees made of aluminum weigh some three pounds a pair less than those made of maple. Then too they are free from charring, chipping, and shrinking, and as they always have a square edge, both firsts and seconds can be made on the same trees. In case the style of toes change in boots or a different foot is advisable, the same leg can be used with a foot of any shape. In the wooden tree both foot and leg are destroyed by the heat and by use. Several hundred pair of aluminum trees are in use in one of the large rubber-shoe factories and are said to give excellent satisfaction.

GUSTAV MANN ON RUBBER-CULTIVATION.

READERS of THE INDIA RUBBER WORLD are aware that the most notable single attempt at the cultivation of India-rubber trees is that inaugurated by the government of Assam at Charduar in 1873 and still continued. During the greater part of the time the plantation of *Ficus elastica* referred to was under the official control of Mr. Gustav Mann, who was until 1891 forest conservator for Assam, and whose yearly administration reports form the most valuable summary of facts respecting rubber-cultivation ever written. Mr. Mann's experience is here referred to for the purpose of properly introducing the following extract from a letter to THE INDIA RUBBER WORLD, from Mr. Mann, dated at his present home in Munich, Bavaria. In requesting copies of this journal containing certain articles on rubber-cultivation, he remarks that he is interested in whatever may pertain—

to the conservancy, cultivation, and yield of other [than *Ficus elastica*] rubber-trees or climbers, American as well as African, since very little is known about this subject. A knowledge of it is necessary in order to enable one to form correct conclusions as to how far rubber-cultivation can be carried on as an economical industry, or must receive protection and support from the state where India-rubber is to be grown, as in the case of most other forest products. This, no doubt, is the question that will have to be considered in the immediate future. I do not know of one species [of India-rubber] which will not rapidly diminish in numbers and more or less disappear altogether from the natural forests, without protection.

* * *

CEYLON is beginning to report practical results from her India-rubber plantations, which were reported, last summer, to embrace 635 acres. The Colombo *Observer* says that the official returns of exports from the island during 1894 included crude India rubber of the value of 4400 rupees. While the rupee is nominally rated at 2 shillings, it is probably worth now 21 cents in United States money, which would give $932.40 as the value in our money of the Ceylon rubber. It will be understood, of course, that the greater part of the plantations are not yet ready to yield rubber.

* * *

THE following communication published in *The Tropical Agriculturist* (Colombo) may possibly serve to throw some light upon the slow progress made in rubber-culture generally. It will be remembered that Mr. Clements R. Markham, who was so largely instrumental in introducing rubber-culture into India, in an article contributed some time ago to THE INDIA RUBBER WORLD, mentioned more than once the "official apathy and indifference" shown toward the plantations even after they had been started, he evidently feeling that under more favorable management the Indian rubber experiments would have resulted more satisfactory. The card to the Colombo paper reads:

TO THE EDITOR: I think you must attribute the failure of the rubber enterprise in Ceylon to the mismanagement at Kew. I went to Kew to inquire into their methods; but there was nobody in the place who had ever been in a rubber country, or who knew an atom about cultivation, collection, etc.; in a word they knew absolutely nothing beyond the Latin names of the trees. I am not a botanist, but I have seen rubber-trees and collected rubber from them; and I feel sure that had your planters obtained help from natives of South America instead of from the incompetents of Kew Gardens, the caoutchouc industry would now be a most flourishing trade in your island. C. PURCELL TAYLOR.

London, January 31, 1896.

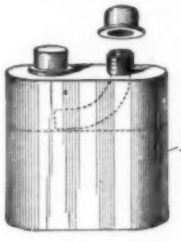
HARD RUBBER IN FOUNTAIN-PENS.

A REALLY good fountain-pen comes as near, perhaps, to filling a long-felt want as any other single product of human skill, while no dictionary contains fitting words for anathematizing a fountain-pen that doesn't work. But all the faults of all the bad pens combined have not discouraged the manufacture of this class of goods. On the contrary, it is asserted by the proprietor of a factory which formerly manufactured fountain-pens on contract to a large extent, but is now out of that business, that the demand for these pens is a matter of constant growth, and they are becoming constantly more popular. Such a statement is easy to believe, in view of the number of fountain-pens constantly exposed for sale.

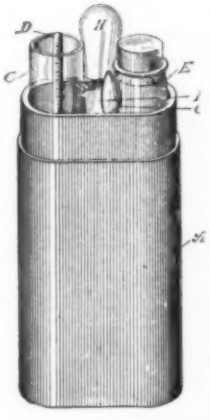
"The pen-manufacturers," according to the authority above quoted, "have changed their practice with regard to the hard rubber used. It was once bought from the rubber-factories in long tubes, fresh from the vulcanizers, and cut into the required lengths at the pen-factories, turned, and otherwise finished. But little such work is now done in New York. The hard rubber now comes from the great hard-rubber factories, cut into single lengths, turned and finished for receiving the metal mountings. This change has been brought about because wages are higher in New York than in any other city in the world."

NEW GOODS AND SPECIALTIES.

DURING a recent visit to the city of Kokomo, Ind., the editor of THE INDIA RUBBER WORLD was witness to a marvellous exhibition of the resisting qualities of a tire, known as the "Uncle Sam." This tire is what is known as puncture proof, and to prove it, the makers secured an expert cyclist and had him ride over planks through which were driven sharp pointed nails and spikes so thickly that it seemed impossible that anything of rubber could go over them and not be simply torn to pieces. In spite of this the rider again and again traversed the space so fraught with danger to the ordinary tire, and beyond a few very slight surface abrasions no harm resulted. A further test that was equally marvellous was riding over a bit of roadway strewn with broken glass. The tires that were made the subject of this exhibit had been used for days before in just the same kind of riding, and were practically as good as new. These tires, of course, are a trifle heavier than the ordinary pneumatic but not enough to lose much in resiliency. It is a fact that there are many users of pneumatic tires who want something that simply cannot puncture, as they are not riders for pleasure, but business riders, and a tire of this kind ought to have a ready sale with them. "The Uncle Sam," by the way, is manufactured by the Kokomo Rubber Co., Kokomo, Ind., and is the invention of Mr. A. J. Whisler, the superintendent of the works, who has been experimenting on it for a number of years.



A HARD RUBBER TEST CASE.



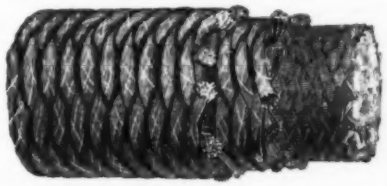
THIS case made to carry in the pocket is just adapted for the physicians' use. It is made of hard rubber with a nickel plated top and is fitted with an alcohol lamp. The case also contains a scientifically correct urinometer enclosed in a cloth bag to prevent breakage, a heavy glass tube serving as an urinometer jar and test tube, a package of Litmus test papers, a pipette for convenience in handling, two vials to contain the test powders, and spoon. With these the following points may be determined at the bedside, viz.: The quantity passed, the color, transparency, reaction, specific gravity, total solids and the presence or absence of sugar and albumen. This case is known as Bartley's Test Case and is for sale by dealers in surgical goods the country over.

SEMIBRONZE PACKING.

THIS is the name given to a new high grade packing for engines and pumps. The core, which is the foundation of the packing, is a lubricator reservoir, and is composed of loosely spun asbestos thoroughly saturated with high grade cylinder oil, pressed into the desired shape and coated with pure foliated graphite. The covering consists of alternate strands of hemp and asbestos loosely spun, each braided over with an openwork of very fine brass wire.

All of the strands are very loose and fluffy, so that they will readily soak up oil and hold it, and the braiding of the wire being quite open permits the oil to flow readily from the fiber and carry along with it the graphite to the piston rod when heated.

Beside serving to hold the soft fluffy materials together, the wire adds to the lasting qualities of the packing, both by its own resistance to wear when properly lubricated and by reason of its protection of the fibers from being blown out of the stuffing box by steam or water pressure. This packing is used in the same way as common fibrous packings, and needs no special handling or care. The value of Semibronze packing has been fully proved by actual practice in hard service. It has given entire satisfaction wherever put in, both as to its lasting qualities and the bright appearance of the piston rods. Many of the piston packings on the market are made without a full knowledge of the requirements. The Semibronze is the result of years of experience of a practical and well-known engineer and pump builder. It is put up in twelve feet lengths, each length in a separate box labeled, and sells at a popular price. Two brands are made, viz.: "Gilt Edge" and "Combination." Circulars and further information will be furnished our readers upon application to the N. J. Car Spring & Rubber Co., Jersey City, N. J.



THE "VOLT" AND "TRIM" TIRES.

THE illustrations show two very handsome and popular single-tube tires that have lately been placed on the market and are finding ready sale. As a matter of fact there is little to

be said about a first-class single-tube tire except that it is made of good material, and that its finish and durability are such that it appeals to the experts in the trade. All this can be said of the two tires here shown. The makers have been active and successful manufacturers of rubber goods for over forty-seven years. These tires are manufactured by the New Brunswick Tire Co., New Brunswick, N. J. The Enterprise Rubber Co., No. 207 Congress street, Boston, and No. 111 Reade street, New York, are selling-agents.

ANOTHER RAPID-FLOW SYRINGE.

THE rapid-flow fountain syringes are so called from being provided with larger tubing than was formerly used, which gives an increased volume of water and more pressure. The Mattson Rubber Co. have brought out lately a new size of their rapid-flow syringe, smaller than the syringe already on their list, and described as No. 2. A novelty in connection with this size is the box in which it is packed, being in the form of a book,

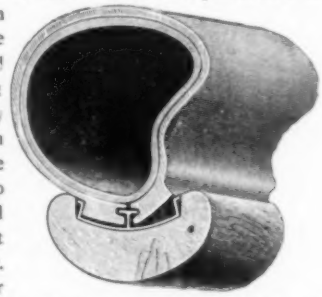
and having the general appearance of one, and designed for standing on end on a shelf either at the druggist's or in the household. Some of these boxes have been labeled "Ready Reference Book," and it is expected that the idea will help to call attention to the goods. The illustrations show the box both as opened and when closed. The tubing in these syringes is ¼-inch in diameter. Manufactured by the Mattson Rubber Co., Nos. 241-243 Greenwich street, New York.

AETNA LAWN SPRINKLER.

THIS sprinkler, which is made by a large manufacturer of specialties for lawns and gardens, is said to possess special advantages over the spider leg sprinklers, in that the base is made of cast-iron, and can be bolted upon the upright, thus always standing firmly; whereas by the old arrangement, when the legs are screwed in, it is impossible to so arrange the thread that they are always turned to the right point, the result being that the base is likely to be very unstable. The sprinkler revolves smoothly and easily, is finished in red, and is an attractive form of lawn ornament. The Aetna which is here shown is 24 inches in height. A companion to it, known as the Columbia, which is made up on the same lines, stands 12 inches in height. Manufactured by W. D. Allen & Co., 151 Lake street, Chicago, Ills.

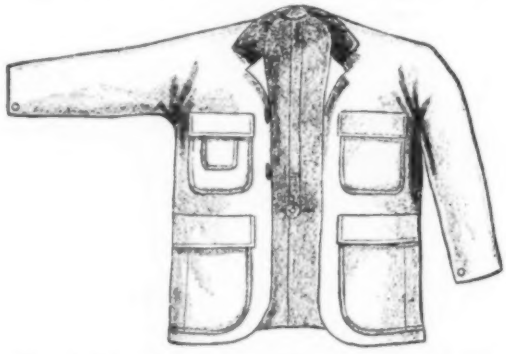
THE ERICKSON TIRE.

THE tire here shown is of the detachable type, but does not depend on inflation for attachment to the rim. The rim is made with a square recessed face and fitted with a metal formed with a T-shaped projection in the center running around its circumference. Each edge of the cover of the tire is formed with square edges, seating in the rim, and the extreme edges are molded with a slit running around the circumference so as to fit over the T of the strip. To attach the tire it is placed on the rim in the usual manner and the edges are lifted so that the T in the center of the rim will seat in the slit of the rubber, then the rim side of the shoe is pushed home and the tire inflated. A feature of this tire is, that should it be punctured or deflated the tire will remain on the rim. The tire is made with a folded wire, vulcanized in the edges so it seats the centrally located T or it may be vulcanized hard enough to do away with the inside reinforcement. This strip makes the tire strong and stiff against side strains, but allows it to stretch laterally. In order to protect the inner tube from friction and possible damage from contact with the T a strip of rubber or canvas completely covers the metal. The inventor desires to license some responsible maker to manufacture the tire. The patent is the property of Lewis A. Erickson, Stromsburg, Neb.



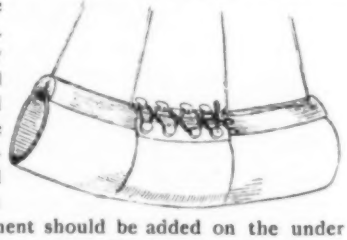
SEAMLESS SHOULDER GUNNING COAT.

THIS coat is made up of special serviceable waterproof cloth, known as the "L. S. S." brand. The garment is made in a new and original manner, which has been patented. The point of excellence in it is the seamless shoulder, which gives the gunner perfect freedom for his arms. Thus he can raise the gun to his shoulders without lifting the load in the pockets. Further than this, there is no binding about the arms. The strain is also taken away from the neck, and it acts as a yoke at the shoulders, distributing the weight of the load over them, instead of at the neck. Manufactured by J. R. Farrell Co., 765 Washington street, Boston.



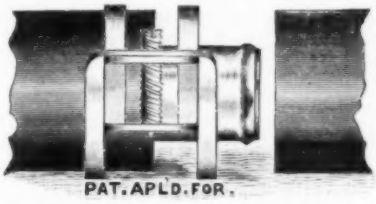
TEMPORARY TIRE REPAIRER.

THIS repairer is simple and effective, and will allow one to ride almost any distance after it is well adjusted. It is easily applied by any one, being simply placed over the puncture, laced around the rim, and the tire inflated hard. To insure extra strength and to keep the air from working out, a little cement should be added on the under side. Manufactured by Noyes Bros., Washington and Summer streets, Boston.



DOUBLE CLINCH HOSE-BAND AND MENDER.

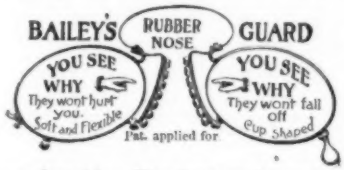
A HOSE-BAND and mender tube of seamless brass is shown in the illustration. The mender tube is arranged to go within the hose and has fitted to it a double metallic band with a brass set screw. This brass tube is easily adjusted giving full opening for the water-flow, never clogs, and of course never rusts. The screw cannot be detached from the band, but the band itself can be removed and replaced any number of times.



The band is attached by tightening or loosening the screw which is easily done with a screw driver. The mender is light, strong, easily affixed and may be used to fasten couplings, nozzles, and other hose fixtures. Menders and bands are made in five sizes from one half-inch upward. Manufactured by Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

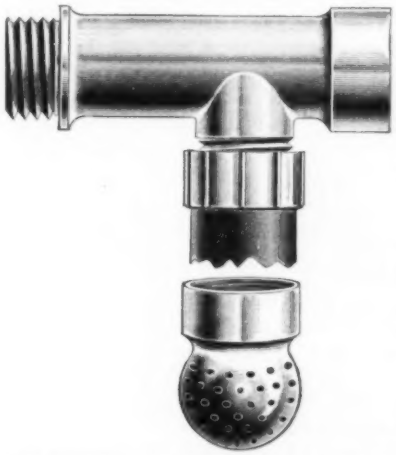
BAILEY'S RUBBER NOSE GUARD.

THE illustration shows plainly what this article is and how it is used. It is simply two strips of rubber with projections that rest against the bridge of the nose, holding the glasses securely in position. These points are made cup-shaped, like a fly's foot, and being exceedingly soft and flexible at the top the pressure is very light and can never be uncomfortable. The distance between the tiny rubber cups allows of ventilation and does not retard circulation. The rubber is not affected by perspiration, and no matter in what position the head may be held, the glasses are sure to cling in place. The impression caused by wearing this guard is so light that it passes away almost as soon as the glasses are removed. Manufactured by C. J. Bailey & Co., 22 Boylston street, Boston.



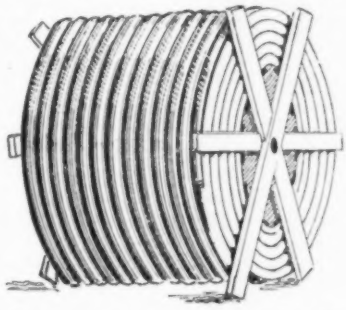
FLORISTS' AND GARDENERS' ATOMIZER.

THE illustration shows an article that has already become very popular among gardeners and florists, and to an extent for lawn use. It is a metal atomizer used to distribute liquid fertilizer. The illustration shows how it is used. The stream of water flowing from the hydrant carries with it a certain amount of liquid fertilizer already mixed in the barrel, and sprays it where it is most needed. The appliance is so made that either a large proportion or small proportion of the liquid fertilizer can be sprayed, and as its parts are very few there is no danger of clogging. The atomizer is manufactured by the Boston Woven Hose and Rubber Co., Boston, Mass.



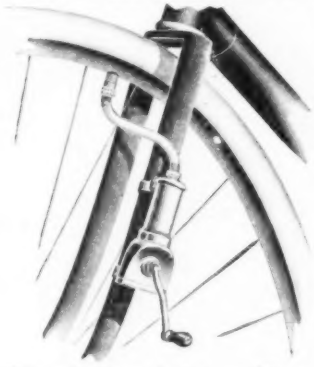
THE VELVET MOLDED HOSE.

GARDEN hose made in 500 feet lengths has already been described in THE INDIA RUBBER WORLD and is here illustrated. In the velvet hose the outer cover is ribbed longitudinally, the advantage being that it is less liable to kink, and in addition, it has a soft, velvety finish, that has made it very popular. This hose is made of a heavy braided cotton tube, through which the rubber of both inner and outer cover is forced, the whole being vulcanized into one homogeneous whole. To show the strength of this hose, it has been twisted tight over one hundred times without showing signs of serious injury. For sale by John E. Rhoads & Sons, Philadelphia, Pa., manufacturers' agents.



THE CRANK BICYCLE PUMP.

A PUMP that is as powerful as a foot pump, and at the same time so small that it can be carried in the vest pocket is shown in the illustration. The leverage obtained by use of the crank is such that five pounds of physical effort will produce eighty pounds of air pressure in the tire. Every revolution no matter how slow will force the full air capacity of the pump into the tire, as every stroke is positive in its operations. Manufactured by S. T. Howard's Sons & Co., 21 Mercer street, New York.



A NEW FOOTHOLD.

A VERY neat and attractive bit of rubber foot wear in the shape of a tiny foothold is soon to be put upon the market. It is radically different from anything heretofore produced, and while it protects the foot from the wet as well as the ordinary rubber shoe, it is so compact that a pair can be carried in the vest pocket without inconvenience. Illustrations of it will appear in a later issue. It is the invention of Mr. C. J. Bailey, Boylston street, Boston, Mass.

EASTER day in San Francisco, says an exchange, was a great rubber day. Although the downpour of rain from early morning until late at night was unceasing, and at times very heavy, the flower-bedecked churches throughout the city sheltered overcrowded congregations and everybody wore rubbers.

* * *

IT is asserted that pneumatic-tired carriages are becoming popular in Paris, on account of their noiselessness and easy running. Some of the livery companies say that the rubber tires render vehicles cheaper to maintain than those fitted with ordinary wheels, as springs are dispensed with and the other portions of vehicles are less worn by strains and shaking up when rubber tires are used.

BRIEF ABSTRACTS OF RECENT RUBBER PATENTS.

AMONG recent patents issued by the United States Patent Office, embodying applications of India-rubber or Gutta-percha to a greater or less extent, have been the following. It is not practicable here to do more than to note the use of rubber in each case, with sufficient detail to enable those who are interested to decide whether or not to look into any particular patent more fully:

TIRES.

No. 556,379.—Punctu e-proof Tire. Abram L. Smith, Brooklyn, N. Y., assignor, by mesne assignments, to the Lo g Island Rubber and Cycle Company.

A puncture-proof strip for pnematic tires, consisting of a backbone in combination with ribs projecting laterally from each edge, the backbone and ribs being inclosed in pockets or envelopes of flexible material which are hinged together.

No. 556,777.—Inflater for Pneumatic Tires. Joseph Savoie, Central Falls, R. I.

The combination in a tire-inflater of a hollow, cement-bearing needle having eyes, channels, and threads, passing through the eyes, with an auxiliary ball placed within the tire, and itself filled with a porous and elastic material, and having openings for the purpose specified.

No. 556,931.—Pneumatic Tire. Thomas B. Jeffery, Chicago, Ill.

In a pneumatic tire, in combination with the tire-cover and the inflatable core, a pad located outside the core and within the cover, composed of a sheath or envelope of textile fabric, and a filling of fiber neither felted nor woven, but closely packed in the sheath.

No. 556,933.—Pneumatic Tire. John G. A. Kitchen, Manchester, England.

The combination with a pneumatic tire of a flat, link chain outside thereof, and connecting the ends of a wire, inserted into the edge of the tire.

No. 557,033.—Apparatus for Manufacturing Pneumatic Tires. Joseph Sherbondy, Akron, Ohio, assignor to the Diamond Rubber Company, same place.

In an apparatus for vulcanizing pneumatic tires, the combination with the circular mold-sections formed with semicylindrical grooves, upon their inner sides and with intersecting semicylindrical grooves at their meeting ends, the plates secured to the sections, formed with semicylindrical grooves, and the bracket secured to one of the plates, of the tube located in the intersecting grooves, of the mold-sections, having an enlarged upper end formed with a screw-threaded recess, the coupling connected therewith, the intersecting air-supply tube, the screw-threaded valve, engaging with the upper end of the coupling, the screw-threaded clamping-screw, passing through the bracket, and the milled head on the upper end of the valve, against which the clamping screw presses.

No. 557,030.—Wheel-tire. Haselwood Carmont, Kingston-upon-Thames, England. Filed Nov. 4, 1895. Serial No. 567,921.

The combination in a wheel-tire, of a gutter-shaped rim having inwardly-extended side flanges, a rubber liner fitted into the rim and having a channeled, projecting portion, a plurality of outer gutter-shaped tread-sections inclosing the channeled portion of the liner, and keys driven into the channeled portion of the liner to secure the tread-sections thereupon.

No. 557,531.—Punctureless Pneumatic Tire. Charles P. Conrad, Denver, Colo., assignor of two-thirds to Charles T. Clymer, Henry Thompson, Gustave Boelke, William Capelli, William Meyer and Frank Baliat.

The combination with the hood having a shallow dovetailed groove formed in its tread, and recesses or sockets formed in the bottom of the groove, but not extending entirely through the fabric of the hood, of an endless band engaging the groove in the hood and of less thickness than the depths of the groove whereby flanges of the hood project beyond the band on either side thereof, the band being provided with beveled edges adapted to fit the dovetailed portions of the groove, and also provided with projections formed on its inner surface, adapted to enter the recesses in the bottom of the groove.

No. 557,128.—Mold for Making Pneumatic Tires and Covers for Same. John F. Ives, Cleveland, Ohio.

A mold for pneumatic tires and covers for the same, consisting of an outer mold-ring having a mold-cavity in its inner face, an inner mold-closing ring having scarfed ends and means for expanding it, and a valved inlet into the inner mold-closing ring.

No. 557,138.—Vehicle-Tire Clamp. Frank P. Miller, Jersey City, N. J., assignor, by mesne assignments, of one-half to Jerome M. Schwerin, Newark, N. J.

In a vehicle-tire clamp, a band of flexible material adjustably attached at one end to a U-shaped hook, and at the other end fixedly attached to a U-shaped lever-catch, both hook and lever-catch working pivotally in their attachments, and the hooks adapted to engage the bar of the lever-catch, so wise, that the catch-bar can be depressed below the fulcrum-bar.

No. 557,151.—Bicycle-Tire. Philip Schau, Cooper, Mich.

A tire having its tread portion provided with a flat inner surface, and cone-shaped studs attached to or integral with said surface, with their small flat ends pointing toward the wheel-hub, the base of the studs contacting with each other in each row, and the base of the studs of each row fitting in the hollows between the studs of the neighboring rows, and contacting with the base of the latter-named studs.

No. 557,409.—Woven Fabric for Wheel-tires. James Lyall, New York, N. Y.

The herein described fabric for wheel-tires, woven as a strip of canvas with the warp and the weft threads corrugated or crinkled nearly uniformly where the same is to be folded to form the edges of the hollow wheel-tire, and the central portions of the strip and the portions that lap upon the central portion of the strip having the warp-threads corrugated or crinkled to a greater extent than the weft-threads, the fabric, however, being adapted to lie flat during the calendering operation or when the rubber is applied to the surface thereof.

No. 557,441.—Pneumat c Tire. Charles S. Scott, Cadiz, Ohio.

In a bicycle-tire, the combination, with the inner and outer tubes, of the fabric pocket or envelope attached to the inner tube, and the stiffening member, such as steel wire, inserted in the pocket or envelope, this stiffening member extending the entire length of the inner tube whereby the tube can be threaded into the outer one, which is tubular in form, said member being wholly within the outer tube.

BOOTS AND SHOES.

No. 555,996.—Pneumatic Last. Gilbert C. Bemis, Worcester, Mass.

A pneumatically-inflatable shoe last, made of flexible elastic fabric, and having a rigid heel block or frame, a hollow inflatable and collapsible fore part, and a shaped stiffened sole portion.

No. 556,161.—Electrotherapeutic Body-wear. George Quarrie, Brooklyn, assignor of one-half to Charles J. Kintner, New York, N. Y.

The described improvement in therapeutical devices consisting of an overshoe, or rubber having conducting material incorporated with or embedded in the rubber or substance of which the shoe is made, and adapted to make electrical contact with corresponding conductors embedded in the shoe of the wearer.

No. 556,059.—Rubber Boot. Joseph Lacroix, Fall River, Mass.

In combination with the main or outer portion of the boot and the lining thereof, a skeleton frame comprising a ring or

band set horizontally near the upper edge of the boot-leg, a part set next the sole, and vertical connecting stiffening-strips connecting the parts and loops secured to said uprights, all the parts of the frame being between the lining and outer portion of the boot.

MECHANICAL GOODS.

No. 556,610.—Lawn-Sprinkler. Charles A. Ashton, Piqua, Ohio.

In a lawn-sprinkler, a spraying-head, consisting of an apertured base having a flanged upper end, a coiled spring on the base within the flange thereof, and a cap having on its under side a flange surrounding the upper end of the spring, and provided with an apertured plug.

COMPOUNDS.

No. 556,700.—Adhesive Composition. Hugh G. Smiley, Chicago, Ill., assignor to Arthur G. Smiley, San Francisco, Cal.

An adhesive composition consisting of glue, water, white sugar, glucose, chloride of calcium, a solution of rubber and glycerine in substantially the proportions indicated, and essential oil sufficient to relieve the finished product from the smell of benzine, and suitable coloring-matter.

DRUGGISTS' SUNDRIES.

No. 556,859.—Nipple for Nursing-Bottles. Eugene C. Myrick, Providence, R. I.

The combination, with the head or major part, of an elastic annula base or end portion having a pair of packing rings, integral with and forming a part of the base, capable of being distended over the end of a suitable tube, and having the ring part arranged to be rolled rearwardly upon the base to form an outer packing, and at the same time reinforcing the base.

MISCELLANEOUS.

No. 555,933.—Bicycle-Pedal. Albert E. Curtis, Worcester, Mass.

The combination of a pedal-frame, two independent, furcated or grooved rubber foot-pieces, mounted on each side bar of the pedal-frame, and clamping-plates for securing the rubber foot-pieces in place, the clamping-plates being made substantially in the form of a grating, and the rubber foot-pieces being recessed or cut away to form abutments corresponding with the opening in the clamping-plates.

No. 556,681.—Inclosing Case for Erasive Rubbers. Joseph E. Landers, New Bedford, Mass.

An inclosing case for erasive rubbers and the like, consisting of the semi-circular members pivotally connected, and telescoping one within another, a spring interposed between lips on the members, and tending to open the latter, a locking tongue on one member, and a coöperating lip on the other, all operating.

No. 556,762.—Eraser. George W. Moorhead, Milltown, N. J.

The combination of a rubber eraser and a steel eraser, the steel eraser being provided with a shank, and with jaws adapted to grasp the rubber eraser, one of the jaws being hinged and provided with a spring.

No. 556,930.—Dress-Stay. Julius Janowitz, New York, N. Y.

A stay having a metallic core tapering in thickness toward the end, and covered with an impervious coating also tapering toward the end.

No. 557,396.—Apparatus for preventing sinking of ships and for raising sunken vessels, etc. Frederick Kindt, Saratoga, Wyo., assignor of one-third to John C. Davis, Rawlins, Wyo.

In apparatus to raise sunken vessels and prevent sinking of ships, the combination of an inflatable gas-tight and water-tight bag adapted to be secured to water-craft, or submerged objects, a collar fastened in an aperture in one part of the bag, a plug detachably secured in the collar and provided with a safety valve, tubes secured to the inner side of the plug to contain a gas-producing material, and each communicating at one end with the interior of the bag, a cartridge in the open end of one of the tubes, electric wires connecting with the cartridge, a fuse extended from the material in the closed end of one tube, to the material in or near the open end of the other tube, and a hood for the open ends of the tubes.

No. 557,521.—Runner for Rocking-Chairs. William Werner, Brooklyn, N. Y.

The combination, with the rocker of a rocking-chair or other piece of furniture, of a rubber cushioning-strip provided with a convex middle portion, and longitudinal side ribs, keepers attached to the sides of the rocker, and provided with inwardly-bent flanges for retaining the side ribs of the rubber strip, and protecting-caps attached to the ends of the rocker, and adapted to retain the upturned end flanges of the rubber strip.

THE ADAMSON SCREW PRESS.

THE illustration shows a new type of screw press that has already been installed in some of the largest mechanical plants in the country. As may be seen, the operator, using a crank, has an exceedingly powerful leverage, and is able to press

by hand any mold that is liable to be put in a press of this type, without the danger that obtains with the hydraulic presses of smashing the mold. These presses are made 16, 20, 24, and 30 inches square. Manufactured by Alexander Adamson, Akron, Ohio.

MR. FABER'S LIABILITY.

REFERRING to a published report of a suit brought against Eberhard Faber, the pencil-manufacturer, growing out of his former connection with the now defunct corporation of F. J. Kaldenberg & Co., he writes to the New York *Herald*:

"Will you kindly correct the statement contained in an article published in the *Herald* of yesterday, concerning some alleged liability on my part for the debts of a corporation? The facts in the case are simply these—namely, some suits have been brought against all the directors of a late company, including myself, for an alleged liability, based on the alleged failure of the company to file an annual report many years ago, which suits are still pending. EBERHARD FABER."

RECENT DEATHS IN THE RUBBER TRADE.

DENNIS CONNELL GATELY was born at Roxbury, Mass., on August 12, 1816; he died at his residence in Mamaroneck, Westchester county, N. Y., on April 3, 1896, after an illness of twelve days.

Being obliged at an early age, by the death of his father, to contribute to his own support, he mastered the trade of housewright, at which he worked successfully until in his thirtieth year. His energy and thoroughness attracted the notice of John Haskins, an early rubber inventor and manager of the old Roxbury Rubber Co., which was the cause of his being selected in April, 1846, to be superintendent of the rubber factory, at a time when efforts were to be made for a wider practical and commercial use of Goodyear's discovery of the vulcanization of rubber. The factory was the one now owned by the Boston Belting Co. About that time the business was carried on by Messrs. Tappen, Charles McBurney, and John H. Cheever. Ten years later, or in April, 1856, Mr. Cheever became treasurer of the New York Belting and Packing Co., and Superintendent Gately accepted his invitation to go to New York. It was then intended that he should take charge of the company's manufacturing interests in the city, but, some difficulties arising at

DENNIS CONNELL GATELY.

the factory at Newtown, Conn., Mr. Gately was sent there, remaining until the wooden buildings were burned, on September 27, 1856. The rapidly growing business of the company made it necessary that a new factory should be built promptly, and in this emergency Mr. Gately's skill as a builder proved of great value. The buildings completed in the winter of 1856-57 are still standing and in use, with few changes in their original arrangement. By this time Mr. Gately had become a fixture at Newtown, which remained his home until the fall of 1884, when he retired from active work. After the death of Mr. Henry F. Durant, Mr. Gately was offered the presidency of the New York Belting and Packing Co., but he declined the position on account of having already under consideration his retirement from business.

With many hundreds of men under him, and a large manufacturing business to watch in every detail, Superintendent Gately yet found time for designing and introducing new machinery and new methods, and improving the character of the company's products. The value to the India-rubber industry of his inventions can be only meagerly indicated in a newspaper article.

At Mamaroneck Mr. Gately lived quietly in a handsome house on the Boston post-road. He was interested in the public affairs of the town, but never was active in politics. He was a trustee and, latterly, vice-president of the local savings bank. As a man, he was kind, genial, and unassuming, and highly esteemed in every relation in life.

At the age of thirty-five Mr. Gately married Miss Olive F. Perkins, daughter of William Curtis Perkins, of Maine. She survives him, together with three sons and three daughters, the head of the family being the first to pass away. The interment took place at Newtown on April 6.

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DEATH OF ALEXANDER BOYD.

ALEXANDER BOYD was born in Boston, Mass., February 13, 1830. He was educated in the public schools of Boston, and after a few years spent with the Niles Locomotive

ALEXANDER BOYD.

Works at Cincinnati, Ohio, and the Conestoga Mills at Lancaster, Pa., he joined his father and brothers in the firm of James Boyd & Sons of Boston, in 1857. From that time until shortly before his death, he was closely connected with the manufacture and sale of fire-hose. His father (James Boyd) obtained the first patent ever issued by the United States government for improvement in fire-hose, this patent bearing date of May 30, 1821: and his brother (John C. Boyd) in August, 1859, invented and patented rubber-lined cotton hose, which is now used so extensively throughout the world. The firm of James Boyd & Sons, of which Mr. Alexander Boyd became senior partner after the death of his father and brother, introduced cotton hose to the public at the "Firemen's Muster," which occurred in Manchester, New Hampshire, in September, 1859. The original cotton hose was woven flat like a piece of belting and the side of the fabric intended for the inner surface

of the hose was coated with rubber. After receiving the rubber coating, it was made into tubular form by riveting the two edges together with copper rivets in the same manner as leather hose. This hose was known as the "Boyd hose," and in a few years obtained a high reputation. It was later improved by Mr. J. B. Forsyth of the Boston Belting Co., who originated the method of lining the hose with rubber after it had been riveted into tubular form. This hose was superseded in 1875 by the seamless cotton hose, invented by Mr. J. Van D. Reed, who organized the Eureka Fire Hose Co. In the early days of Eureka hose, Mr. Alexander Boyd was intimately connected with Col. Richard Vose, Mr. J. Van D. Reed, Mr. B. L. Stowe, and Mr. Junius Schenck, all of whom are now dead, excepting Mr. Stowe, who continues as vice-president of the Eureka Fire Hose Co. Mr. Boyd also invented the method of attaching hose couplings by means of the expansion ring. This method has since been adopted, and is now used by nearly all fire departments in this country.

The firm of James Boyd & Sons, which had been established in 1819, was dissolved in February, 1886, after an honorable existence of 67 years. Mr. Boyd at that time, retired from active business, but a few years later he joined his sons, James and Alexander, Jr., who had established the firm of James Boyd & Brother in Philadelphia. In that city he resided with his eldest son, and although he did not take an active part in their business, his experience and advice were of great assistance and value to them. Mr. Boyd always enjoyed excellent health until a few months before his death, which occurred on April 4, 1896. He left three sons and a daughter.

Mr. Boyd was known the country over as an able and successful business man, with a reputation for fair dealing and sound judgment that but few attain to. The general expressions of esteem and sorrow that his death have called out from his contemporaries in the rubber trade show how unanimously he was appreciated and loved.

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DEATH OF THOMAS A. EGAN.

THE trade will be exceedingly pained to learn of the death of Mr. Thomas A. Egan, Superintendent of the New Jersey Car Spring & Rubber Co., Jersey City, N. J. Mr. Egan had a long and successful career as a rubber manufacturer. His connection with the New Jersey Car Spring & Rubber Co. dated from 1886. Prior to that he was connected with a large company in the same line of manufacture, by whom he was regarded as a most expert rubber man. Not only was Mr. Egan a singularly well equipped rubber man, but he was also an expert machinist and a natural mechanic. Hence it was natural that he was in his proper element in the manufacture of mechanical rubber goods, where special machines and methods are constantly called for in the daily factory work. He was the inventor of numbers of machines and a variety of products and processes which are today in successful use in the factory of the New Jersey Car Spring Co. Not only was Mr. Egan a very capable man but he was one who had a singularly high sense of honor, and endeared himself to the employés in the factory while possessing in full measure the esteem and confidence of the officers of the corporation which he so faithfully served. He died on April 22d, after a brief illness, of typhoid fever. He was thirty-seven years of age, and was interred at Newtown, Conn., a host of mourners attending the funeral.

THE Clifton Rubber Co. (Hyde Park, Mass.) are erecting a new factory-building, to cost $14,000.

AFFAIRS OF THE BOSTON RUBBER CO.

AT the adjourned annual meeting of the stockholders of the Boston Rubber Co., on April 25, Mr. George H. Hood, president and treasurer, and Mr. F. C. Hood, assistant treasurer and secretary, who resigned, together with Mr. Joseph Banigan and Mr. George A. Alden, were retired, as directors. A new directory was elected, consisting of Robert D. Evans, Samuel P. Colt, Henry L. Hotchkiss, S. Lewis Gillette and George P. Eustis. Mr. Gillette, who is manager of the clothing department of the American Rubber Co., was elected president, and Mr. Eustis, the assistant treasurer of the same company, was elected secretary and treasurer. Directly after the election Mr. Gillette took charge of the orders and the stock, and Mr. Eustis of the books, and began the process of liquidation of the company.

The factories at Franklin and at Chelsea had been shut down since April 1 and an account of stock taken. The selling force were also notified that after May 9 their services would no longer be required.

The Boston Rubber Co. was incorporated in 1878, having a factory at Chelsea, Mass., and was founded by George H. Hood, after he withdrew from the American Rubber Co. The business at the beginning consisted of the manufacture of wringer-rolls, in which they did the largest business of any single concern, and also the manufacture of rubber-surface clothing and general mold-work. Some three years ago the American Wringer Co. established a rubber plant of their own for the manufacture of rolls, since which time the outside business in rolls has been small. In 1890 the Boston Rubber Co. began the manufacture of mackintosh clothing on a large scale. The goods made at the Chelsea factory in late years have been mackintoshes, carriage cloth, rubber-surface clothing, and some mechanical goods. The first quality goods were all stamped with the well known "Bell Brand." In 1888 the Boston Rubber Co. purchased the rubber-shoe factory at Franklin, Mass., and began the manufacture of rubber footwear, also stamped with the "Bell Brand." The output of this factory was about 4000 pairs a day, one-fourth of which were boots. In 1892 the Boston Rubber Co. became a part of the United States Rubber Co., having at that time a capital of $300,000. There were employed at the Chelsea factory about 300 hands, while at the Franklin factory there were about 250 hands employed.

Mr. George H. Hood and his sons have taken offices at the Rich building, No. 220 Devonshire street, Boston. It is rumored that they intend starting a new corporation with ample capital and will continue in the manufacture of rubber goods. This rumor, however, is neither affirmed or denied by Mr. Hood, who simply says that, whatever he does, it shall not be done hastily. Mr. Hood, by the way, is said to be the fourth largest individual stockholder in the United States Rubber Co.

THE Diamond Rubber Co. (Akron, O.), have just installed a battery of eight steam presses of a new type built by Alexander Adamson, Akron, O.

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DENMARK during the year 1894 imported 256,629 pounds of India-rubber and Gutta percha, raw and manufactured, valued at 930,967 kronen; of which amount Germany furnished more than one-third.

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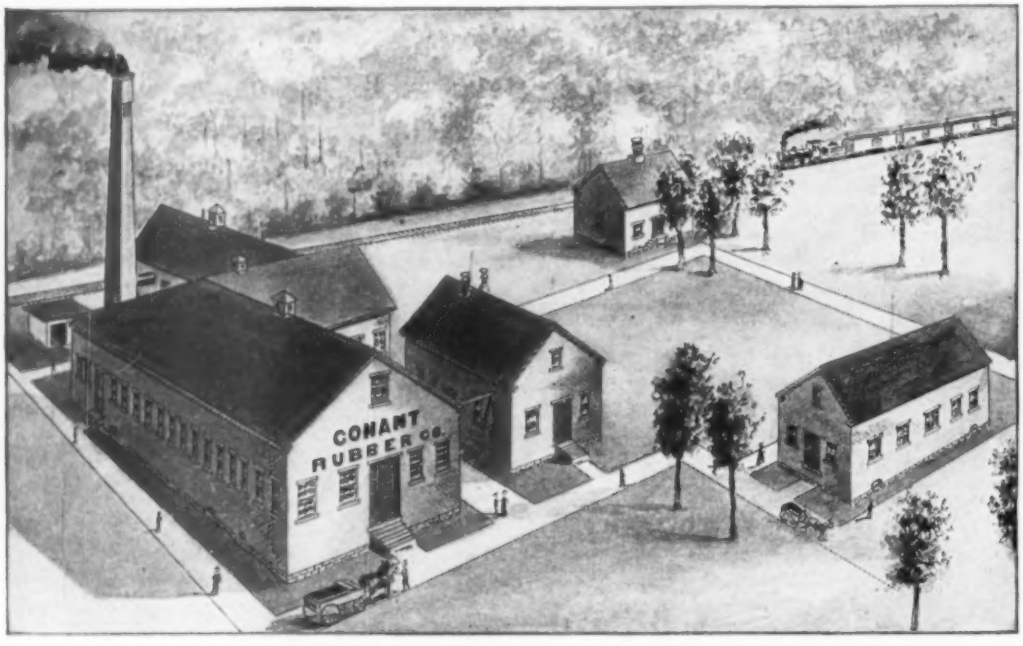
THE government of Ecuador, with a view to meeting increased expenditures and paying off some loans, lately issued a decree imposing extra duties on certain articles of export, including India-rubber. The extra duty on rubber is about 50 cents per 100 pounds.

THE FACTORIES OF THE CONANT RUBBER CO.

SUBSTANTIAL brick buildings, new machinery and especially convenient arrangement, is what one would be particularly struck with in visiting the factories of the Conant Rubber Co. at South Framingham, Mass. Beginning at the source of power, there are two Dillon boilers, and a 150 h. p. engine built by C. H. Brown & Co. of Fitchburg, Mass. Then too there are the usual fire pumps and automatic sprinklers. The water supply is obtained from a brook that flows through the grounds, and there is also a good city supply always available.

The grinding room is a model in its way. There are four 16 × 42 mixing mills, one washer, built by the Farrel Foundry & Machine Co., and fitted with patent cooling rolls, safety friction clutches and everything that can increase convenience in handling, or produce better quality goods. Close to the grinding room is the compounding room which is fitted with a row of churns designed by Mr. T. H. Videto the superintendent. Adjoining this is the spreading room where are two English spreaders of a new type, also the invention of the superintendent. The cutting and making-up rooms are ample, light, and there is every evidence there of careful work, and no lack of knowledge or appliances to produce it. The two heaters are double walled, and are built in a manner that insures the even distribution of the heat through the hanging garments.



The plant throughout is such that it is a pleasure to visit it. The 82 foot stack, solid brick walls, slate roofs, cement floors, electric lights, solid beams, Southern pine finish; all show the intention of securing the best in the way of building materials and construction, that the plant might be an ideal one. Each department is so separated that the whole plant is practically fireproof. The cement and naphtha is stored in a separate brick building apart from the others, and close to the spur-track that brings in supplies and over which finished goods are shipped. The factory is run by that veteran in fine rubber and mackintosh clothing, Mr. T. H. Videto. As an assistant or rather associate in factory management he has his son Mr. N. C. Videto. The proprietors of the Conant Rubber Co. are Messrs. Herbert I. and George M. Conant, who have fine offices and ample warerooms at 170 Purchase street, Boston.

A NEW USE FOR ATOMIZERS.

A YOUNG New Yorker, salesman for a druggists'-sundries house was traveling in the state of Coahuila, Mexico, about two years ago, and went one night to Saltillo. It was the first time he had been in the town and after transacting a little business he started out to see the sights. As he entered an isolated street he was suddenly confronted by a brigandish-looking fellow, who, in mongrel Spanish, demanded his valuables. The highwayman held in one hand a long, sinister-looking knife, and waved it about in a suggestive manner which implied the necessity of ready compliance with his wishes or a tragic result. But the salesman was a man of quick wit and ready resources. Instead of handing over his property he thrust his hand into his pocket, and a moment later the cold, shiny barrel of what seemed to be a revolver was pointed at the would-be robber's head. The surprise caused by the unexpected production of a revolver produced a change in the confident manner with which the robber had confronted the New Yorker; and he started back. Instantly the salesman knocked the knife from his hand, stooped down, picked it up, took the highwayman by the collar before he could escape and marched him before the police authorities. At the preliminary trial of the would-be robber the following morning the guilt of the prisoner was readily established, and his commitment was about to follow when he asked if it were not an offense for strangers in the country to carry concealed weapons. He was told that it was. Then the native justice asked the salesman if the charge was true. This was admitted. He was then asked if he had still the weapon concealed on his person. The young man said that he had but pleaded that its possession had, the night before, prevented a robbery and possibly a murder. He was informed that such a circumstance did not alter the case that he had violated the law and must suffer.

The prisoner smiled sardonically on beholding the tight place into which the authorities were seemingly drawing the New Yorker. His mirth, however, turned to disgust when the young man pulled the alleged revolver from his pocket and laid it down before the magistrate, and it proved to be nothing but a cologne-atomizer.—*Baltimore Sun.*

HEARD AND SEEN IN THE TRADE.

THE real magnitude of the rubber-tire industry never before had such an illustration as was afforded last month in Dublin by the sale of the Dunlop tire interests for upwards of $15,000,000 in cash, four-fifths of which amount was for patents and good-will. By the way, this sale does not affect the American Dunlop Tire Co., who are a distinct concern, working under different patents. But it will affect no end of other interests abroad, since the transaction appears to have been but the initial step toward consolidating within narrow limits the whole tire interest in Great Britain. The subsequent purchase by kindred interests of the "Clincher" tire puts an end to a great battle over patents, and has led to talk of a consolidation with a capitalization of $30,000,000, in the face of which no other concern is expected to have a chance for existence.

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"THAT is just what may be expected to happen in the United States," said one of the largest rubber-manufacturers in the country. "All the different producers of tires here, working under hundreds of patents, cannot expect to live in the business, much less make money. Consolidation is inevitable. It was the same thing in the sewing-machine industry. I was urged by perhaps forty different sewing-machine concerns to become interested in their business, but always declined, feeling that in the process of consolidation certain to come every one of these concerns would cease to exist, and they did. Not only is a combination of tire-makers already in progress in the United States—under the cover of a license arrangement—but consolidation in another direction is to be looked for. I mean the manufacture of tires and bicycles under the same management. Anybody with any sort of skill can buy parts and put them together into bicycles, but when the crucial test comes which is to mark the survival of the fittest, the men who survive will be those manufacturing both bicycles and tires."

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"IF I were making tires to-day," the rubber-man continued, "I should add the manufacture of bicycles as speedily as possible. But I hear that Morgan & Wright, supposed to have the largest tire business of any single firm in the country, and who have made money at it, are planning to add not bicycles but a general line of mechanical rubber goods." On the same day a dealer in materials who supplies most of the concerns in the trade assured me that the rubber-tire output from Hartford had become almost as large as that from Chicago, and the close connection of the Hartford works with important bicycle-manufacturing interests would seem to add force to the suggestion above quoted about the tendency toward combination.

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ON every hand the continued advance in crude rubber is attributed in part to the active buying by the bicycle interest. The condition of the mechanical-rubber and rubber-shoe industries, while these have been good consumers during the past year, has not been such as alone to call for such high prices as have actually been paid for crude rubber within a month. Nobody pretends to know how many wheels or tires or pounds of rubber will be involved in the bicycle trade, with every manufacturer exerting himself to make his output as large as possible before the season ends. Some of the larger operators in tires buy well ahead, as has long been the custom of rubber-manufacturers, but other and smaller concerns, through lack of experience, perhaps, or because of the growth of their business beyond all expectations, have been at the mercy of any and all conditions of the market. The tire season, by the way, no longer has any limit. A large crude-rubber operator told me that orders were coming in from the bicycle trade for rubber for summer delivery, which would indicate that the output of tires is likely to become continuous.

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"YES, the late snows pretty generally dissipated the stocks of rubbers in the hands of retailers," said a rubber-shoe man, "but this fact will not count for as much as formerly. It doesn't matter what kind of shoes were sold last year, or how many were left over—the rubber-footwear manufacturers this season will have to create entirely new stocks, conforming to the pointed-toe craze in leather shoes. That is one of the drawbacks of the business; when a new style becomes popular the left-over goods might as well be thrown away." The same speaker told me that his tennis-shoe trade already this season had been in excess of the whole of that for last year, and it was one of the things past finding out why tennis-shoes, which seemed almost to go out of demand at one time, should again grow in popularity at such a rate as has been witnessed during the past two seasons.

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"WHAT is finally to become of all the good rubber now going into bicycle-tires will not be long in growing into a practical question," said a rubber-man. "Every way that I turn there is nothing else so much in evidence as the trade in bicycles, and every man seems to be getting a new wheel. I can't help asking where all the old wheels and tires go. One thing certain is that the tires will find their way sooner or later to the rubber-mill, there to be utilized as old shoes are now. The rubber-reclaiming people haven't yet mastered the treatment of bicycle-tires, perhaps, but when they do, one result will be to help to keep down the price of crude rubber."

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MR. A. H. ALDEN, vice-president of the New York Commercial Co., said to me: "The production of rubber is independent of the fluctuation of prices. The output from the Amazon, with few exceptions, has regularly increased, one year over another, without regard to prices here or in Europe. The price is more apt to be influenced by the yield of a crop season, or by the promptness or lack of it with which rubber is conveyed to market, or by the size of stocks as affected temporarily by the rate of buying. Of course, if the demand for rubber should be threatened with a permanent decline, the effect would be felt in time on the work of the rubber-gatherers. But this class to-day pursues its work in the belief that there is a market for all the rubber that can be gathered, and that it will always be so. If the price should be a little higher next month, or a little lower next year, the people who tap the trees might never know the difference. What does 65 cents or 75 cents or 85 cents a pound at New York mean to laborers who are miles from a telegraph office, where values are counted in milreis, sucres, or annas, and weights in kilograms, arrobas, or maunds? When balls of rubber are paid for with merchandise in barter, the value of goods in civilized countries counts for little.

"One thing which has been taught by the experience of the trade for fifty years is that the production of rubber has always kept pace with the demand for it, and there is no reason why it should not be expected to continue indefinitely. While the world's visible supply of rubber is short just now, with every

department of rubber-manufacture apparently growing, the gathering of rubber may safely be expected to increase fast enough to meet all demands. Prices are high now and possibly may go higher, but the more prices advance, the lower they are likely to fall when the reaction comes. After rubber had reached 97 cents in 1890, it soon declined to 64; in 1891 it got up to 90 cents, and fell again to 62; and so one might go on indefinitely. While it is well to be prepared for high rubber before the new crop season begins, there is no need to expect permanently higher prices than the average quoted for the past season. There are more rubber-gatherers and more rubber camps than ever before, more transportation facilities in the rubber countries, and more people handling crude rubber. There will be rubber enough to meet every want long after everybody now in the business has ceased to be interested in it."

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CRAVENETTE goods seem to be gaining in popularity again in different quarters, and, since the passing of winter and the weather for mackintoshes and rubber clothing, some of the rubber concerns are energetically pushing the sale of cravenette. These goods are not offered as water-proof but only shower-proof, and their special fitness is for use in summer during an outing, or in travel, where it is desirable to have some protection against rain in an emergency, which will serve also as a comfortable wrap during cool evenings. These light garments are being brought out lately in unusually attractive patterns and styles, and at prices by no means low. The American Rubber Co. are handling them largely this year, making up garments in their factory from imported cloths, and I am told that some first-class dry-goods houses in New York city who have refused hitherto to handle cravenette goods have placed their orders liberally of late.

THE MAN ABOUT TOWN.

COLONEL THEODORE A. DODGE.

COLONEL THEODORE A. DODGE.

IT is probable that no rubber manufacturer to-day is the object of keener interest, or is more widely discussed than is the owner of the Tillinghast tire patents, who is also the subject of this sketch. Col. Dodge was born in Pittsfield, Mass., of old New England stock, his father being the well known writer Mr. N. S. Dodge. Young Dodge was sent abroad at the age of ten years to be educated. He first went to school in Belgium, and later to Berlin, finishing his course at Heidelberg. It was his plan to complete his law studies and practise at the American bar, but on his return to the United States, in '61, the war having broken out, he volunteered as a private soldier in the army of the Potomac. Here his German military training was of such advantage that at the age of twenty-one he was in command of a regiment. He was in every battle in which the army of the Potomac engaged from Fair Oaks, on: was wounded at Manassas and Chantilly and lost a leg at Gettysburg. His regiment, the 101st New York Volunteers, had the third highest percentage in killed and wounded in any one action of any during the civil war, their record being 74 per cent. Col. Dodge received four brevets for gallant service, and was finally placed on the retired list on account of his wounds.

In spite of the fact that he was a retired officer he has been exceedingly busy since the close of the war. He has often lectured at Lowell Institute, Boston, and at Harvard college and has crossed the Atlantic some thirty times.

As a contributor to the leading literary reviews both at home and abroad, and as an author whose books are classics in their lines, Colonel Dodge has achieved a measure of literary success not often attained by a business man. His "History of the Art of War" is an elaborate and scholarly work, four volumes of which, "Alexander," "Hannibal," "Cæsar," and "Gustavus Adolphus," are already finished, while two more, "Frederick the Great," and "Napoleon" are in preparation. In addition to these he is the author of "The Campaign at Chancellorsville," "A Bird's-eye View of the Civil War," "Patroclus and Penelope," "Great Captains," "Riders of Many Lands," etc.

It is however with Col. Dodge's business career that we naturally have most to do. In 1870 he became treasurer and manager of the McKay Sewing Machine Co., and during the ten years that he held that position the company paid in dividends between five and six hundred thousand dollars a year. While he was still treasurer he purchased the patents controlling the Tapley burnishing machines, and realized for its owners from royalties on them some $2,000,000. Indeed this latter enterprise grew so large and so profitable that he resigned from the management of the McKay Co., to care for his own interests. In the meantime in connection with Mr. Robert Cowen, he had been experimenting on cotton woven hose. For a number of years, and indeed until the necessary machinery was perfected, the venture was not remunerative. In 1880, however his company, known as the Boston Woven Hose Co., began to be very profitable and since then has made enormous strides. To-day it is one of the largest mechanical rubber manufactories in the United States as well as one of the largest producers of single-tube tires. It was through a practical interest in the "Vim" single-tube tire which this company manufactures that, Col. Dodge became the owner of the Tillinghast patents. He by the way, is president of this company, which is capitalized at $900,000 and has a magnificent plant at Cambridgeport, Mass. Col. Dodge is the owner of a very handsome estate in Brookline, Mass., and also has a home in Paris, usually spending six months of the year abroad.

THE New York Commercial Co., Limited, removed on May 5 from Broad street to No. 82 Chambers street, in the first block west of Broadway, where they will occupy the whole of the first floor. The object of their removal is the increased convenience from being near to the offices of the rubber concerns who are their largest customers, and it is in the line of consolidation of the rubber business in New York within a narrow district. The company will have more floor space in their new quarters than in the old.

NEW TRADE PUBLICATIONS.

THE latest edition of the illustrated price-list of the Tyer Rubber Co. (Andover, Mass.) appeals at the outset to the customers of a long-established house by enumerating the additions to their line of products since the last preceding issue. Some of these are tobacco-pouches, velvet-eyed catheters, several new hard-rubber atomizers, stomach- and rectal-tubes, and a seamless syringe. There is also an entire new line of fountain- and bulb-syringes, water-bottles, atomizers, and nipples described as the "Homestead" line, to distinguish them from their standard "Tyrian" rubber goods. These have been brought out in answer to a certain demand for a line of goods to be sold at a lower price than those of the quality of the "Tyrian" can be sold for. As the firm name "The Tyer Rubber Co." is so closely associated with "Tyrian" rubber goods, the "Homestead" line will be sent out as manufactured at the Andover Rubber Works. The business of this firm was founded just forty years ago by the late Henry George Tyer, and during this period the output of the factories has increased until there are now embraced a great variety of standard goods and specialties for the druggists', stationery, barbers'-supply, sporting-goods, and notions' trades, besides mold-work generally. The variety ranges from football bladders, tennis- and golf-handles, and carriage-cushions, to elastic bands and rubber stopples, besides the articles which have been mentioned above. This price-list makes a book of 104 pages and is fully illustrated.

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A NEW general catalogue has been brought out by the Boston Belting Co., to supersede the editions for 1894 and preceding years. Each new issue of this publication is fuller with respect to the number of articles of manufacture by this company described in its pages. The wide range of products of the company includes rubber soling for boots and shoes, and especially for tennis goods. The catalogue is also enhanced in value more and more with each edition in respect to the practical information which it contains for the users of hose. The tables and rules given are trustworthy and capable of being applied by any engineer and superintendent. They refer to the dimensions of rubber belting required for a given amount of power-transmission, the quality of water discharged through hose of different dimensions, etc., all of which information is copyrighted. A feature which appears for the first time in this catalogue is a special telegraph code for the convenience of customers in sending orders. The catalogue is handsomely gotten-up and contains 128 pages.

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CATALOGUE No. 22, of mechanical rubber goods made by the Peerless Rubber Manufacturing Co. (New York), contains 82 octavo pages, including discount sheets, and is bound attractively in flexible cloth. The numerous illustrations are designed with a view to giving the best possible idea of the appearance of the goods described, and for this purpose the use of colors in the printing has been introduced. The catalogue relates particularly to "Rainbow" and "Peerless" packing, "Rainbow" and "Eclipse" gaskets, "Peerless" and "Lakeside" hose, and "Rainbow" belting, besides which there are many minor products. The company pay a large amount of attention to supplying railway hose.

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THE catalogues for the new season of the rubber-shoe companies are more attractive than ever in the matter of design and make-up. A comparison with former issues will show the omission of some lines which have become less popular, and the addition of styles and shapes demanded by the changing tastes of wearers. Yet the trade is so much made up of standard lines that the changes are not, after all, of great importance, if exception is made of the uniform tendency toward narrower toes. An improvement is shown this year in the illustrations in these catalogues. Only the initiated can realize the difficulty of portraying on paper, by any process, the appearance of a rubber boot or shoe, but this difficulty has been more nearly overcome in some of the new catalogues than in any printed matter we have seen heretofore. The catalogues for 1896-97 have been received of the New Brunswick Rubber Co., the Goodyear's Metallic [Wales-Goodyear] Rubber Shoe Co., L. Candee & Co., United States Rubber Co. [Jersey Co.], Woonsocket Rubber Co., and the Meyer Rubber Co.

New price-lists have also been received from the following companies:

American Rubber Co., Boston; seconds, branded "Pará."

Woonsocket Rubber Co., Woonsocket, R. I.; seconds, "Rhode Island Rubber Co."

Meyer Rubber Co., Milltown, N. J.

Wales-Goodyear Shoe Co., Naugatuck, Conn.; seconds, "Connecticuts."

New Brunswick Rubber Co., New Brunswick, N. J.; seconds, "Essex Rubber Co."

L. Candee & Co., New Haven, Conn.; seconds, "Federal brand."

A specially-printed price-list of The L. Candee & Co.'s goods has also come from the Enterprise Rubber Co., No. 111 Reade street, New York, who handle these goods exclusively.

The price-list of the United States Rubber Co. (New Brunswick, N. J.), is devoted to the "Jersey Co. brand," and contains this prefatory note: "For many years the Jersey rubbers were classed as 'firsts' and successfully held their own with other 'firsts.' For the last three years we have branded them 'seconds'; but they are every whit as high grade goods as when branded 'firsts.' As a matter of fact, they are even better, for we have within the past two years equipped our factory with new machinery throughout."

A TOWN DIVIDED OVER RUBBER BOOTS.

PUBLIC sentiment in the village of South Norwalk, Conn., was lately divided over the question of the wearing of rubber boots by pupils in the common schools during the hours of study. It was urged on the one hand that rubber boots are necessary for the protection of the health of the children on the way to and from school, that all are not able to provide a change of footwear for use indoors, and, furthermore, that every parent has the right to dress his children as he pleases. The latter view was contested by a writer in the *Evening Sentinel*, who insisted that the maintenance of the public schools is dependent upon the yielding of individual tastes and preferences whenever these conflict. The best interests of public education and the wearing of rubber boots during school hours are incompatible, he insisted. "However much John's predelictions and individual tastes may run toward rubber boots," he said, "he should hesitate, out of regard for the feelings of Willie, who is obliged to sit next to him, to inflict the aroma of the boots, which is disagreeable to a cultivated sense."

THE RUBBER SITUATION IN MADAGASCAR.

MADAGASCAR as a source of India-rubber is destined no doubt to become largely more important. The exports of rubber from that island have fluctuated from year to year, sometimes declining so far as to induce fears of the early extinction of the yield, which were strengthened by reports of the destructive methods of the rubber-gatherers. But again the output has increased, while each successive traveler returning from Madagascar has thrown new light upon the extent of the rubber forests. Some facts of interest in this connection have been supplied to THE INDIA RUBBER WORLD by Mr. John L. Waller, some time United States consul at Tamatave, who has lately returned to America after his release from a French military prison, his troubles having grown primarily out of a concession to him of valuable rubber lands by the Malagasy government without consultation with the French authorities.

This large island is covered, for the greater part, by virgin forests throughout which, so far as foreigners have made their way, India-rubber vines and trees abound. By the way, most authorities have attributed the Madagascar rubber to vines of the genus *Vahea* (similar to if not identical with the *Landolphia* vines of continental Africa), but, according to Mr. Waller, a more important source of rubber is a large tree which he has not been able to identify botanically. This tree often grows to a diameter of twelve to eighteen inches and in such numbers as to make the ground seem almost bare after the reckless rubber gatherers have gone over a strip of forest with their axes. A peculiarity of the tree which Mr. Waller reports to have seen personally is that the roots are not killed by the felling of the trunks, but that new shoots invariably spring up, becoming large enough in a few years to yield rubber. Thus the extinction of the supply is provided against by nature, which is not true of the Pará rubbers or the *Landolphia* climbers. The tree likewise grows readily from the seed.

The usual practice of the native rubber-gatherers is to proceed to the forest in gangs, armed with axes for felling trees and galvanized-iron buckets for catching the sap. The fallen trunks are chopped or sawn into lengths of three or four feet and supported over the buckets until all the rubber sap has drained from the bark. Mr. Waller reports having seen two quarts or more of sap yielded by a single stick of wood. Coagulation is effected by stirring a few drops of acid into a bucketful of sap and allowing it to stand in the sun for several hours. There is as yet practically no proprietorship in these lands, and the rubber-gatherers have been free to wander at will in the forests. But the governor of the province in which Mr. Waller's concession is located has orders from Antananarivo to prohibit trespassing upon it after the limits shall have been surveyed, and the next step will be to put an end to the destruction of the trees.

The concession covers 144,000 acres of forest lands, to be located in the best rubber district in Madagascar, which is in the southeastern portion, including the old French station, Fort Dauphin. This has been the chief place for working rubber on the island, and, as it is distant from any consulate, and as the English and French traders are secretive about the extent of their business, doubtless not a little rubber has been exported of which no record ever reached the various consuls stationed at Tamatave. Rubber near the coast began to be scarce several years ago, but the natives asserted that more was to be found farther inland, and now the seat of the industry has been removed to a district about three days distant from Fort Dauphin. Twenty two dollars are paid there for a hundred-weight of rubber. Fort Dauphin has been styled a halfway house between Europe and the Orient, and it is now a port of call for the Castle Mail Packets Co., Limited, and another line of steamers. There are from two to four ships and sometimes more per month in the harbor. The climatic conditions at this point are good, the lands are fertile, the cost of living is low, and a consideration which induced the Hovas to grant this concession was that it might lead to immigration from Mauritius and elsewhere and the development of various industries at Fort Dauphin.

It is the belief of the *concessionaire* that the district would be well fitted for colonization by Afro-Americans, who would find there better advantages for trading than they enjoy in the United States. The Hovas are an educated race, and foreigners from several countries have made fortunes in trading with them. Mr. Waller will attempt to find means in this country for developing his concession, the status of which, he claims, has not been changed by his troubles with the French authorities. In what light it will be viewed by the latter, however, remains to be seen. He believes that a field exists for a much wider direct trade between the United States and Madagascar. While the foreign traders have been mainly English and French, the American house of Ropes, Emmerton & Co., of Salem, Mass., long had a successful career at Tamatave, retiring from the trade during the troubles growing out of the late French war. The house of George Ropes, of Boston, entering the trade later, is now established at Tamatave, Vatromandry, Antananarivo (the capital of the island), and Finanarsoa. A large business is done in the selling of American cotton goods to the natives.

The British and American imports of Madagascar rubber, which presumably include almost the entire output of the island, have been of late years as follows :

UNITED STATES.	Pounds.
1891-92	174,919
1892-93	275,331
1893-94	265,411
1894-95	31,003

GREAT BRITAIN.	Pounds.
1890	624,848
1891	729,232
1892	996,240
1893	1,040,920
1894	984,816

There must also be taken into account the British imports of rubber from Mauritius, which are mainly derived

from Madagascar, and which amounted in 1894 to 168,336 pounds. Altogether, the official figures available point to an average annual output of Madagascar rubber in recent years of 1,162,000 pounds. If it be true that the supply is practically unlimited, the ever-growing commercial spirit of the age, the increasing means of transportation, and the utilitarian spirit which must inevitably stop the waste of trees, will without doubt combine in largely and permanently increasing the yield.

Madagascar rubber is classed in the markets as "pinky" and "black," the former being the more valuable. When asked whether one kind was probably yielded by trees, and the other by vines, Mr. Waller replied that he could not say.

MINERAL RUBBER AGAIN IN EVIDENCE.

CONSIDERABLE interest has been aroused among rubber men recently by the announcement that Mr. Joseph Banigan was the owner of a large deposit of mineral rubber somewhere in Utah. This interest showed itself largely in a shower of questions directed to THE INDIA RUBBER WORLD. That others interested may know what mineral rubber is said to be, and what it really is, we quote from the daily press and from our own articles upon this subject. A writer from Washington, D. C., informs the public that George Eldridge of the Geological Survey was sent to Utah by the government to look up certain natural resources. Among other things he found great deposits of mineral rubber, enough so the correspondent says, to make gum shoes for a large part of the population of the United States. The reporter describes it as being black and looking and feeling exactly like India-rubber even to being as elastic as that gum. He quotes Mr. Eldridge as saying, "There is no telling how many valuable uses it may be put to in the future, but I imagine that it will be employed largely mixed with the vegetable India-rubber of commerce. In the mining towns of Utah mineral rubber is utilized commonly for roofing, being prepared in sheets consisting of layers of burlap with the rubber on both sides. In this state it is thoroughly waterproof. Only a few tons of it have been mined so far, near the Uintah reservation, where it is chiefly found. It occurs in veins but the number and size are not reliably known as yet."

The foregoing leads us back to an article published in THE INDIA RUBBER WORLD in November, 1894, concerning the Elaterite Rubber Mfg. Co. of Denver, Col. Mr. Wm. A. Perry, their president, was at that time in New York, and he stated that he owned a mine in the Uintah reservation in Utah, and further than this that he had leased of the government 300,000 acres of land surrounding it, and that for a term of 30 years. His mine showed a surface cropping 6 feet wide and 7000 feet long. This mineral rubber, or mineral caoutchouc, or elaterite, is a hydro-carbon of the petroleum series. It is only semi-elastic and Mr. Perry's plan was, through the use of some solvent to make a dough, mix the gum with sulphur and then vulcanize it. He was quite confident that this gum could be used in all lines of rubber manufacture for the production of rubber belting, packing, insulated wire and electrical goods, etc. He refused to sell any of the gum in any shape to rubber manufacturers as he intended to keep it a monopoly for his own company. What progress has been made in this business since Mr. Perry's return to Colorado we do not now know, but we feel justified in saying that as far as we have seen elaterite is in no danger of displacing India-rubber, nor will it even take the place of recovered rubber.

MAMMOTH DEALS IN TIRES.

AT a general meeting of the stockholders of the Pneumatic Tyre Co., Limited, held at Dublin on April 13, it was decided to accept a cash offer of £3,000,000 for the Dunlop tire patents and business, good will, etc., owned by that corporation. This closes the history of one of the most remarkable business successes of modern times. The company began business in 1889, to manufacture tires under the patent of John B. Dunlop, which was afterwards found to cover no invention not anticipated in Thomson's patent of 1845. But the Welsh patent was acquired, and the company proceeded. The amount of cash placed in the hands of the directors at the beginning was £15,000, increased subsequently, by reason of changes in and additions to the business, to £260,000. On the other hand, the directors have returned to the the shareholders £395,778 in dividends and £262,345 profit on shares sold, making a total of £658,123, after which they now make a sale of the whole business for £3,000,000. This will be divided, after paying an *ad interim* dividend of 5*s.* per share, by allotting £12 12*s.* 6*d.* per ordinary share and £7 10*s.* per preference share, the par value of the shares being only £1. It is estimated that the original shareholders will receive £52 for each £1 invested, in addition to the dividends already disbursed. This allocation leaves a margin of £80,000, which will be distributed among the employés of the company who have contributed toward its success.

The names of M. D. Rucker and E. T. Hooley as purchasers have been given out. They have been successful hitherto in large transactions, and are supposed to be in accord with the India-Rubber, Gutta-Percha, and Telegraph Works Co., Limited (Silvertown). It was at once announced that their plan was to float a company with £5,000,000 capital to work the Dunlop and some other tire patents. Subsequently a syndicate headed by Harvey du Cros, who was at the head of the Dunlop company, purchased the "Clincher" tire patents from the North British Rubber Co., Limited (Edinburgh), for £1,000,000, and it is believed that the two interests will be consolidated. The immediate result of these transactions will be to end the litigation between the owners of the Dunlop and "Clincher" patents. The indications are of an ultimate trust or consolidation of the whole tire interest in Great Britain.

THE CAUSE OF DULL TIMES.

TO THE EDITOR OF THE INDIA RUBBER WORLD: It is all well enough for you to say that business ought not to be dull when millions of people are at work, and factories are running, and the railroads performing their service. On its face this theory does appear to be sound. But even with great apparent activity business may be affected unfavorably by a general feeling of depression, caused by a lack of confidence in the future.

Whether rightly or wrongly, very many people have strong convictions on certain matters which they believe to vitally affect the welfare of the country, and they look to their representatives in congress to give force to their views as the only means of averting ruin. This manufacturer wants more protection, or that wants free raw material, or another wants a gold standard and still another free silver; whenever a change in national policy is pending men of all these classes become too much disturbed about the outcome to give their best energies to business, to plan far into the future, to develop new ideas, to take bold steps which might lead to new successes. Something like this is affecting American industries at this time. The rubber-manufacturer who, in a period of settled business, might

buy raw material freely, now buys cautiously, taking only enough to supply his immediate wants. His production, too, is limited to positive demands from the trade. His employés feel uncertain about their earnings, having no assurance of full time and corresponding wages. Everywhere credits are grudgingly given—by the banks, in making loans to manufacturers, and by tradespeople in selling supplies to wage-earners.

More is necessary than merely that people should be at work to make business active. The difference in the number of the employed in good times and in bad times is really not very great. But it makes a decided difference whether employers and employés are cheerful and hopeful, planning with certainty for the future, or are uncertain and fearful lest all their work should be for no profit. It is not a light matter to bring about a lack of confidence in business, and our lawmakers ought to be most careful about handling subjects liable to unsettle established conditions.

You will find it easier, Mr. Editor, to say that everybody ought to declare dull times at an end and then go to work than it will be for most people to take your advice—at least until the natures of our people have become changed. J. P. G.

Newark, N. J., May 2, 1896.

CULTIVATING MANGABEIRA RUBBER.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Is there any country outside of Brazil where the "mangabeira" tree grows? Do they plant mangabeira trees, or gather the rubber from the forests as they do in Pará? If planted, how long will it take for the trees to grow? How much rubber will a tree yield, whether cultivated or in a wild state? What will be the best way to plant the trees? How long will the trees last? I should be very much obliged for any other information on the subject of mangabeira rubber. J. P. T.

New York, April 13, 1896.

[MANGABEIRA rubber is the product of the tree known botanically as the *Hancornia speciosa*, which is native to Brazil alone, growing principally in the state of Ceará. On account of the inferiority of this rubber to the Pará grades, comparatively little attention has been given to collecting it. Experiments have been made with this tree at most of the botanic gardens in the British empire, and particularly in India and Ceylon, but nowhere has its cultivation attained practical proportions. We have no data respecting the yield of the trees, or the age at which cultivated trees begin to yield, but it is probable that these trees, like other rubber species, are long-lived under judicious tapping. While the mangabeira trees undoubtedly would thrive on a higher level, in drier lands, and under a lower mean temperature than the *Hevea* trees, which produce the Pará rubber, their cultivation would hardly prove profitable for the reason that their product is worth less than that of some other species which could be cultivated at no greater cost.—THE EDITOR.]

RUBBER TREES IN CUBA.

TO THE EDITOR OF THE INDIA RUBBER WORLD: The *Hevea* does not to my knowledge occur in Cuba. The *Castilloa* however, is to be found there, but not sufficiently for economic use. Many species of *Ficus* are very common in most parts of the island, and it would seem to me that they could be utilized. Several members of the orders *Asclepidaceæ* and *Apocynaceæ*, the latter especially, seem to be prolific in caoutchouc-bearing milky sap, and are common. The *Urceola*, *Vahea*, and *Alstonia*, all members of this family, do not occur in Cuba. Such members, however, as *Tabernaemontana*, *Cameraria*, and *Phunieria* are common. ROBERT COMBS.

Ames, Iowa, April 28, 1896.

[THIS is in reply to a letter written to Mr. Combs, on his return from a visit to Cuba, where he made an exhaustive study of its flora in the interests of the Iowa Agricultural College.—THE EDITOR.]

IS NOT IN THE TRUST.

TO THE EDITOR OF THE INDIA RUBBER WORLD: In the last issue of your paper you have retired me from the manufacture of flexible gas-tubing. Please correct this. I am not in the trust. Will continue in business as usual, and will undersell any combination that can be formed.

NATIONAL TUBING CO.

Providence, R. I., April 17, 1896. Isaac Hahn, Manager.

RUBBER FOOTWEAR EXHIBITS IN LONDON.

THERE is at present a shoe and leather fair in Agricultural Hall, London, which has several interesting rubber exhibits. First is that of the United States Rubber Co., showing principally the Woonsocket and Rhode Island goods. This exhibit comprises elegant samples of sea boots, shower and storm overshoes, a fine overshoe for the "lady horticulturalist," snow boots, men's continentals, and fishing boots from samples arranged by Mr. E. H. Cutler, of Boston. Second, is the India Rubber Glove Co.'s exhibit of "Petite" and "Dandy" rubber overshoes, together with their light weight dress shields and specialties. Third, the Marvel Rubber Co.'s specialties, including the glove-fitting Marvel shoe in the new Razor and Piccadilly toes. These exhibits of goods by the United States Rubber Co. are in the hands of Mr. John Rye, who is the European selling agent, and he claims that it is the best exhibit of rubber overshoes ever made in the Old World.

A spacious stand which is in front of the main entrance has also been erected for the display of goods of the Boston Rubber Shoe Co., showing both Boston and Bay State rubbers. This includes all of their well known specialties, the "Storm Slipper" being particularly in evidence. This exhibit is in the hands of Mr. A. J. Gordon, who is their sole agent for Great Britain.

The North British Rubber Co. of Edinburg have also a fine exhibit of rubber foot-wear of the heavier class, particularly what are known as Ocean boots, and a great variety of waterproofs. The exhibit is in the charge of Mr. Stewart.

A special feature of the fair is a model factory after the style of that shown in Chicago, in which all combinations of American and English machinery are to be seen at work, with the newest developments.

THE Congo Free State has ceased to pay premiums to those agents who gather for it the largest amount of ivory and rubber. These inducements made some officials so exceedingly zealous that they shot natives and burned villages if they failed within a given time to supply the amount of commodities demanded of them. The doings of a few Belgians on the upper Congo were becoming a world-wide scandal, and it was high time for the authorities at Brussels to look into the matter and regulate some of the young men in its service. This has been done, and the good work of the Congo state, it is hoped, will not be so much marred in future by inhumanity.—*New York Sun.*

GROWING RUBBER IN FLORIDA.

A JACKSONVILLE, Fla., paper has lately been giving a good deal of attention to the project of rubber planting in southern Florida. In some of the voluminous correspondence sent to the paper, the point is taken that the cultivation of India-rubber hinges largely upon the same point as that on which the growing of orange trees depends, that is the location of the so called frost line. The rubber tree will stand relatively as much frost as the orange tree. It has done very well in Mexico as far north as Tuxpan and Tampico. It also has this advantage over the orange tree that it will thrive in low swampy soils where frosts are slow to penetrate and where the orange cannot live. Another thing is noted and that is that wherever the alligator is found the rubber tree usually flourishes. A species of rubber tree is said to grow wild to a limited extent in the vicinity of Sarasota Bay, and individual trees have attained quite a large growth on the Keys. The best territory however, so it is claimed, for India-rubber cultivation is a little further south. It is said that the neighborhood of Fort Myers, and in the Everglades the land is well adapted for rubber growing. Most of the rubber producers require a moist, steamy, warm situation where the soil is rich or loamy. A gentleman who is now at Florida Keys looking into the question of rubber planting said in a chat with a reporter:

A RUBBER TREE GROWING WILD AT PALM BEACH, FLORIDA.

"The land of South America is similar to that which I have seen here. I find that all along the coast line canal the lands are especially adapted to the growth of rubber, and the farther south I come, the more favorable seems to be the condition. The climate is not too cold. If planted in a swampy soil, a few hours of such cold as is experienced in the North would have no effect upon the tree, as it is protected by heavy bark and the warm steamy water on the low lands. The rubber, unlike the orange, the pineapple, and other tender fruit trees, is not cultivated for its fruit, neither is any tender bloom to be protected from the cold winds. That which is so valuable to the commercial world is the sap or milk beneath the bark."

"Have you found any of the Pará trees growing in this state?" was asked.

"I do not believe that a genuine Pará rubber tree is to be found here. Several varieties of the rubber grow along the east coast and also in the southern part of the state. I have seen nearly every kind grown, but have found nothing similar to the Pará except a small tree on the property of Commodore Ralph Monroe. This tree is not the genuine rubber tree, but is more like it than any that I have seen here."

"Do any of the trees that are found here resemble in any way the Pará?"

"Yes, they do. The sap of these trees has a little resemblance to that of the Pará, but the tree in appearance is different."

The speaker had also an idea that the milk of the rubber species found along the east coast is destined to become of great commercial use. He will gather a large quantity of this for the purpose of having it analyzed.

Conspicuous among the large number of trees of this variety is the banyan, which derives its name from the species grown in the Persian Gulf. The sap of the banyan makes a splendid mucilage in its crude state, and was also put to other uses by the early settlers and Seminole Indians.

The genuine banyan is the *Ficus Indicus*, and is a tree that easily propagates itself from seed, and that lives for centuries attaining enormous size. It produces a white glutinous sap that is used in making bird-lime, and in some places is considered a panacea for toothache. The gum has been submitted to rubber experts but seemed to be of no especial value for manufacturing purposes. The illustration shows a very good specimen of banyan, or Florida rubber tree, growing wild at Palm Beach.

In this connection an extract from a letter written by the chief clerk of the Department of Agriculture at Washington may be of interest. He writes:

There is no record of the department having made any effort to grow rubber plants in Florida, and it may be safely assumed that rubber bearing trees, being of tropical habitats, cannot endure the climate of that state, so as to be of commercial value.

* * *

THE RUBBER CULTURE CO.

A COMPANY has been formed at Orlando, Florida, to experiment in the growing of rubber trees, shrubs and vines in the vast waste lands in the southern part of the State. To this end H. M. Flagler has donated 300 acres of land at Bay Biscayne in Southeast Florida and in case the business proves profitable, stands ready to grant from ten to twenty thousand acres more. The parties actively interested in the project are J. Orton Kerby and Prof. O. F. Winkleman. The former will start soon for Callao, will cross the mountains striking the head waters of the Amazon and in a canoe trip down the river will engage in trade with the natives, exchanging cheap jewelry, and a variety of goods for *Hevea* nuts, rubber and curios. One of the features of the proposed Florida plantation will be a nursery of *Hevea* trees grown from the nuts.

RUBBER SUPPLIES FOR THE GOVERNMENT.

PROPOSALS for supplies for the postoffice department and postal service were to be opened at Washington on May 7, including various articles of rubber, to wit: Three items of

rubber bands, including one of 4300 gross and another of 8675 pounds; 250 pounds bevel erasers; 150 dozen combined pencil and ink erasers; 25 rubber stamping pads; 275 dozen gutta-percha penholders; 475 dozen combined wood and rubber penholders; 10,100 rubber hand dating and other stamps, with rubber type, pads, etc.

Proposals were also to be opened at the same date for supplying the treasury department and its annexes with miscellaneous supplies, including 5881 self-inking rubber stamps; 1797 wood-handle rubber stamps; repairs to 1470 self-inking rubber stamps; pads, ink for the same, etc.

The department of the interior is inviting proposals for Indian supplies until May 19, including boots and shoes, with the following requirements in rubber goods:

645 pairs men's rubber boots, Nos. 7-11.
2220 pairs boys' arctics, Nos. 1-6.
1150 pairs misses' arctics, Nos. 11-2.
1775 pairs women's arctics, Nos. 3-8.
1335 pairs men's arctics, Nos. 7-11.
776 pairs boys' overshoes, Nos. 1-6.
410 pairs misses overshoes, Nos. 11-2.
1175 pairs women's overshoes, Nos. 3-8.
450 pairs men's overshoes, Nos. 7-11.

These proposals will be received at the warehouse for Indian supplies, Nos. 77-79 Wooster street, New York, where blanks for bids may be obtained.

DAME RUMOR AT FAULT.

THE statement so widely published that Mr. Joseph Banigan intended to start a rubber company for the manufacture of boots and shoes in East Providence, R. I., is laughed at by the directors of the United States Rubber Co., and by Mr. Banigan himself. President Robt. D. Evans of the U. S. R. Co. remarked to THE INDIA RUBBER WORLD: "The newspapers know far more about our plans and movements than we know ourselves," a statement that those who follow the absurd statements of the daily press will heartily endorse.

INDIA-RUBBER INTERESTS IN GERMANY.

THE latest annual report of the Continental Caoutchouc and Gutta-Percha Co. (Hanover) shows a favorable result. The profit for 1895 was at the highest ever attained. The addition of several branches to the business of the company increased their trade materially. The manufacture of bicycle-tires, in spite of keen competition, proved profitable. The agreement among the manufacturers of balls had a beneficial influence, and was renewed for the current year. The business in surgical goods increased largely, even at the depressed prices which prevailed. The air-balloon department was kept uniformly well employed. For several months it was necessary to keep the factory running night and day, to fill orders. The gross profit amounts to 1,043,050 marks [=$260,762.50] and the net profit to 742,779 marks [=$185,694.75], of which 632,779 marks will be disbursed in dividends, the remainder being distributed among officers and workmen. A good business is expected this year.

* * *

THE business report for 1895 of the Rubber-Goods Factory Stock Co. Voight & Winde (Berlin), shows that the works, especially during the last half of the year, were well employed. The depression in prices, however, prevented the profits from being as large as in the previous year, although more business was transacted. A dividend of 6 per cent. was ordered paid at the general meeting on March 16. The year's profits amounted to 70,030 marks [=$17,507.50] as against 80,452 marks [=$20,113] in 1894. The report expresses the hope that, as prices are now down to rock bottom, a gradual improvement may be looked for, which will benefit the manufacturer and consumer alike, as an improvement in quality may then be expected.

* * *

THE management of the Austria-American Rubber-Goods Factory Stock Co. (Vienna) have presented to the board of directors their balance-sheet for the year 1895. It shows that after transcriptions to the amount of 35,722 florins, there remained a net profit of 217,346 florins, as against 162,800 florins for 1894. A resolution was passed to recommend to the general meeting that, after making the legal provisions for reserve and royalties, a dividend of 16 per cent. be paid, and the amount of 13,341 florins carried forward to new account.

* * *

THE Association of German Caoutchouc Manufacturers has adopted the policy recently of presenting a solid front against any patents or trade-marks relating to articles which are already or have been manufactured by the German rubber industry, or have been in general use. In a circular two such articles are mentioned. One is a rubber hose with an inner wall of laced metal wire, for conducting steam, and the other a rubber hose having several layers of woven fabric. These were made by several factories in the past.

Negotiations are under way for the amalgamation of the above-named society with the United German Rubber Goods Manufacturers, the organization of which was reported in THE INDIA RUBBER WORLD last summer. "In what manner this is to be done is as yet undecided," says *Die Gummi-Zeitung*; "at all events it is a happy thought. Two societies in the same field, no matter how stoutly each protects its members, cannot become as important and influential as an organization in which the plans are made, and which is conscious of its ability to carry out such plans. We hope to be enabled to report further on this fusion."

* * *

GERMANY stands fourth in the list of countries from which Spain is an importer of merchandise. In the following table is shown the share of Germany in the rubber trade of Spain, the figures referring to weight in pounds:

	Total Imports.	From Germany.
Rubber and Gutta-percha, unmanufactured	160,567	9,678
Do in sheets, threads, and tubes	114,259	31,981
Do manufactured in any form (except combs)	70,712	4,653
Rubber webbing in connection with other material	250,371	6,228
Do manufactured	127,731	359

Roumania proves a good field for Germany's trade in India-rubber goods, according to the following returns for 1894, the figures being gained by converting the figures in the official tables at 5 francs to the dollar:

	Total Imports.	From Germany.
Rubber and Gutta-percha in all forms, not mixed or cut	$ 5,354	$ 4,087
Do work of all descriptions, not in connection with other stuffs	26,878	12,180
Do goods of all kinds in connection with other stuffs	660,038	259,327

* * *

THERE has been organized at Berlin a syndicate to develop the Cameroons' *hinterland*, and particularly the gathering of India-rubber for direct shipment to Germany from her possessions in West Africa. The capital of the syndicate is 200,000 marks [=$50,000]. Inquiries can be made of H. Jaeger at the office of the Kamerun-Hinterland-Gesellschaft, No. 6 Kulmstrasse, Berlin, W. The prospects for the gathering of rubber in the Cameroons are said to be steadily improving.

TRADE AND PERSONAL NOTES.

THE fourth annual meeting of the stockholders of the United States Rubber Co., for the election of directors and for the transaction of any other business which may properly be brought before it, will be held at the office of the company in New Brunswick, N. J., on Tuesday, May 19, at 12 o'clock, noon. The transfer-books, which have been closed since April 25, will be reopened on May 20.

=The operation of the factories of the National India Rubber Co. (Bristol, R. I.) was partially resumed on April 6, when the twin engines at the south end of the plant were started, and a force put to work on mechanical goods and druggists' sundries. During the following week the new engines on the north side of the works were started, for the manufacture of footwear. The production of tennis-shoes is now active, and about 1000 employés are busy in the whole establishment. Some repairs were made during the shutdown, and the plant is now in first-class order. The total shutdown lasted from March 21. For some time previously the factory was employed only on tennis-shoes, at the rate of from 5000 to 8000 pairs per day, but the mills were run, in one department or another, all through the winter, and everybody in Bristol appreciates the benefits to the town from this fact, even though there was not full time for all the employés.

=At the April meeting of the board of trade of Middletown, Conn., Superintendent Vermilye, of the Goodyear Rubber Co., reported that the company proposed building an addition to their factory, to front on Church street, 50×110 feet in size. The board thereupon pledged its influence toward securing an exemption from taxation for the new building for ten years, in accordance with a recent vote of the town to encourage manufacturing. Work has been begun on the addition, in which a new 400-horse-power engine is to be used.

=The partnership between W. W. Wilder and John H. Barrett under the name of the Hudson Rubber Co. (Hudson, Mass.) has been dissolved, Mr. Wilder retaining the plant. The negotiations with the board of trade of Leominster, Mass., for the removal of the factory to that place, have been dropped.

=Notices were posted at the two factories of the Boston Rubber Shoe Co. announcing a four-weeks shut-down, commencing April 9, or a fortnight longer than usual. The employés had hoped for a shorter shut-down for the reason that the mills had been running for some weeks on three-quarters time. Later the announcement was made that the first ticket on resuming work at Middlesex Fells would be made on May 7, while the Edgeworth mill would have a shorter vacation.

=It is reported that several employés recently discharged at the Millville works of the Woonsocket Rubber Co. were not overseers, as at first reported, but second-hands, who, under President Banigan, received a yearly salary whether the works ran or not. The new management has cut off their pay for the time that the works are idle by discharging them while the works are closed.

=Zachary Taylor Lindsey, the wholesale rubber-goods dealer of Omaha, Neb., is one of the active workers in behalf of an industrial exposition in that city in 1898, for which a corporation has been formed with $1,000,000 capital.

=The factory once occupied by the Pará Rubber Shoe Co. (South Framingham, Mass.) has finally been sold—to the Dennison Manufacturing Co., the paper-tag manufacturers, at the reported price of $100,000—and workmen have begun to remodel the plant for the new owners.

=The National India Rubber Co. (Bristol, R. I.) have been sued for $15,000 by William A. Rawson, an employé, who wants that amount in damages for the injury of a hand in a machine in the cutting department.

=The Knott and Plant Rubber Co., of Minneapolis, Minn., have amended their articles of incorporation to change their title to the Plant Rubber Co.

=The Pacific Rubber Co. (New York) were among the numerous tenants of the Cable building who were damaged by fire on April 22. Their loss was $1000.

=Some little time ago Mr. Peter Wilkes, a manufacturer of rubber machinery in Trenton, N. J., was suddenly killed. Since that time his wife, Mrs. Susan Wilkes, has been running the business and that very successfully. It is believed that she is the only female builder of rubber machinery in the world.

=President Palmer, of the Palmer Pneumatic Tire Co., we regret to announce, is quite ill in California.

=Although the Hartford Rubber Works Co. have just completed a large addition to their plant they are still crowded for room, and contemplate the speedy erection of another building.

=The Peerless Rubber Mfg. Co. (New Durham, N. J.) are planning another addition to their rapidly growing plant.

=Mr. A. L. Lindsey, T. J. Skinner, and Mr. McClintock, of the Stoughton Rubber Co. (Boston) recently took a flying trip to Newtown, Conn , to visit the factory of the New York Belting and Packing Co., Ltd., under the guidance of Supt. Sloane of the works.

=The S. S. White Dental Manufacturing Co., who have a large factory on Staten Island, have lately added a department for the manufacture of rubber goods that their trade calls for, such as dental dam, dental rubber, etc. This department is under the charge of Mr. W. H. Middleton, formerly of the Seamless Rubber Co., New Haven.

=The widely published statement that Mr. F. W. Heustis was connected with the Reading Rubber Tire Co., needs correction. He is not connected with or employed by the company, but has formed a separate corporation for the manufacture of certain tire specialties.

=The Spaulding & Pepper Co. (Chicopee Falls, Mass.) have just added two new Boomer & Boschert presses, and a friction calender to their machinery. They are so busy at the present time that they are running nights.

=The B. F. Goodrich Rubber Co. (Akron, Ohio) are manufacturing the Beebe tires, for the Beebe Tire Manufacturing Co., of Sandusky, Ohio.

=The Indianapolis Rubber Co. (Indianapolis, Ind.), who have a very complete plant for the manufacture of pneumatic tires are making many of the "G. & J." tires both for the owners of the patents and for the general trade.

=Mr. F. W. Heustis and J. B. McCune, both of Boston, have organized the Consolidated Rubber Tire Co., under the laws of the state of Maine, with capital of $600,000. They are to manufacture a new type of rubber carriage-tire, as well as a pneumatic tire for bicycles under a new process, both of these specialties being covered by patents.

=The Boston Woven Hose and Rubber Co. have at their factory in Cambridgeport, Mass., a complete printing and binding department fitted with four hand presses, a cylinder press, plain and job type, etc. With this plant they are able to turn out 25,000 catalogues a week and in addition to this they do all their circular and label printing.

=Captain Harry T. Bragg has resigned from the position of auditor of the United States Rubber Co., and will, in connection with his assistant, resume the business of the professional auditing of accounts, under the style of Bragg & Marin, at an office address soon to be announced.

=Mr. William A. DeLong, of the New York Commercial Co., Limited, sailed from New York on May 2 by the *Umbria* for a brief visit to England, combining business and pleasure.

=The city of Indianapolis recently bought 9600 feet of fire hose, the total bill being $8000. The successful bidders for this were the New Jersey Car Spring and Rubber Co., Chicago Fire Hose Co., Boston Woven Hose and Rubber Co., Fabric Fire Hose Co., Eureka Fire Hose Co., and the Gutta-percha and Rubber Manufacturing Co.

=The Franklin Rubber Co. (Malden, Mass.) are running their factory full time on a high grade of mackintoshes and cravenettes.

=Mr. George R. Allen, formerly connected with the Woonsocket Rubber Co., and the United States Rubber Co., has established a business for himself as expert accountant and auditor, with an office at No. 41 South Angell street, Providence, R. I. He refers to some of the most prominent men in the rubber trade, such as Joseph Banigan, Col. S. P. Colt, and many others who most cordially endorse him in this line.

=Mr. J. A. Barnes, former superintendent of the Eastern Rubber Manufacturing Co. (Trenton) is now superintendent of the tire department of the Indiana Bicycle Co., Indianapolis, Ind.

=Mr. Fred. Morgan, senior member of the firm of Morgan & Wright (Chicago) is having built for himself a $75,000 steam yacht, in which he will cruise on the Great Lakes this summer.

=The Chicago Rubber Clothing Co. (Racine, Wis.) have just completed a new spreading and proofing room, which is as near fireproof as one can be made. It is fitted with a fan for carrying off the naphtha, automatic sprinklers, Scott & Myer spreaders, together with an automatic contrivance for flooding the spreaders instantly in case of fire.

=Mr. Albert T. Holt, has accepted the superintendency of the druggist's sundry department of the Diamond Rubber Co., Akron, O.

=Mr. Blanchard, formerly superintendent of the Chelsea Wire Fabric Rubber Co., is now superintendent of the Peoria Rubber and Manufacturing Co., Peoria, Ill.

=The Home Rubber Co., Trenton, N. J., have completed the installation of a pneumatic-tire plant. They are now molding a high grade single tube tire. They are also fitted to make double-tube tires.

=Mr. J. B. McCune, selling agent of the Reading Rubber Tire Co., has just returned from a business trip through the west.

=The Whitehead Bros. Rubber Co. (Trenton) are manufacturing both single and double tube tires.

=Mr. R. P. Marvin, secretary of the B. F. Goodrich Rubber Co., (Akron, O.) has just returned from a business trip to Europe.

=The "Non-Kink" attachment for garden hose has proved even more popular than the New York Belting and Packing Co. expected, and orders for it are coming in so fast and so generally that they are almost snowed under. Its usefulness in preventing kinks and breaks, and permitting at all times a full flow of water, appeals at once to every user and it has undoubtedly come to stay.

=The name Seiberling is not only well known in manufacturing throughout the middle states, but is becoming quite closely identified with the rubber business. For instance, Mr. Monroe Seiberling and his son own the Peoria Rubber & Manufacturing Co., at Peoria, Ill., his brother James H. owns the Indiana Rubber and Insulated Wire Co., at Jonesboro, Ind., where insulated wire and pneumatic tires are manufactured, the plant being run by his two sons, while Mr. J. B. Seiberling owns the Akron India Rubber Works, Akron, Ohio.

=Mr. Charles L. Johnson, director of sales of the United States Rubber Co., E. H. Paine, Chester J. Pike, and Walter S. Ballou, selling agents, were recently quartered at the Auditorium Annex, Chicago, where they met the Western trade and discussed prices and contracts for the coming season.

=The W. & P. Armored Tire Co. has been formed in Buffalo, N. Y., for the manufacture and sale of an unpuncturable pneumatic tire. The incorporators are M. L. Warson, Kensington, N. Y.; E. W. Pickett, Buffalo, N. Y.; and T. S. Fielding, New York city. The capital is $100,000.

=The Hartford Rubber Works Co. (Hartford, Conn.) have opened a branch house in New York, at No. 100 Chambers street, in charge of H. F. Brandt, in connection with which a well-equipped repair-shop will be maintained. During the past year they have opened distributing depots in seven other cities, including San Francisco. They are preparing to enter the market actively for the sale of rubber tires for vehicles.

=A certificate increasing the capital stock of the Pacific Cable Co. from $100,000 to $10,000,000 has been filed in New York. The directors are James A. Scrymser, J. Kennedy Tod, E. L. Baylies, J. Pierpont Morgan, and S. D. Bowdoin. Active efforts are being made to secure government aid for their project.

=Mr. L. Nussbaum, formerly with the Clifton Rubber Manufacturing Co., of Boston, is now industriously drumming the New England trade for Mandelberg & Co., New York.

=The Central Rubber and Supply Co., Indianapolis, Ind., are making a great push on the seamless tube hose manufactured by the New York Belting and Packing Co., Ltd., and find that it suits their market exactly.

=The Indianapolis Rubber Co., Indianapolis, Ind., are manufacturing and selling the well-known "G. & J." tire, and so busy are they that they are running their plant night and day.

=The *Boston Advertiser* claims that the reason that Geo. Watkinson is again in business as a rubber manufacturer in opposition to the United States Rubber Co. is chiefly because he does not think that the trust pushes business sharply enough.

=The Eberhard Cycle Co. succeed Eberhard & Wright, of Cleveland, Ohio. They write THE INDIA RUBBER WORLD that they are in the market for a full line of rubber goods for cycles, also for cycle sundries.

=The soft flake graphite of the Jos. Dixon Crucible Co. is not only popular with rubber manufacturers for use in compounding, but is also having a great sale as a lubricant on bicycle chains and sprockets.

=As the result of the retirement of Messrs. Lowenthal & Morgernstern from the rubber-reclaiming business, Mr. Morgernstern having withdrawn from active business, and Mr. Lowenthal having gone into the insurance business, their well-known factory at Jersey City is to be sold at auction on June 3, as will be observed by the announcement in our advertising pages this month. The plant is one of the most fully equipped in the trade, and could be admirably adapted to the manufacture of mechanical rubber goods, druggists' sundries, or bicycle-tires, and would, of course, be an exceptional opportunity for some large rubber firm who desire to manufacture their own reclaimed rubber. Full particulars are given in the advertisement.

=The Okonite Co., Limited, removed on May 2 from their old Park-row offices—in a building about to be torn down—to more extensive quarters at No. 253 Broadway, the Postal Cable building, where they occupy rooms, Nos. 411-413. The company had a very attractive booth at the Electric Light Exhibition in New York last week.

=The New York Belting and Packing Co., Limited, for several days past have been busy removing to their new store and offices, at No. 25 Park place.

=Quotations for United States Rubber stocks declined during the past week as low as 22 for common and 79 for preferred, presumably on account of published reports of the intention of Joseph Banigan, formerly president of the United States Rubber Co., to organize an opposition company.

=President A. M. Stickney, of the Wellman Sole Cutting Machine Co. (Medford, Mass.), has just returned from an extensive trip among the European rubber factories.

=The very interesting article in this issue of THE INDIA RUBBER WORLD on rubber conveying belts is from the pen of Mr. Thomas Robins, Jr., the secretary of the Manhattan Rubber Mfg. Co., New York.

=It is said that the Boston Rubber Shoe Co., when pig lead was at its lowest, bought some 300 tons of it and turned it over to Boston lead manufacturers to convert into litharge, the net cost being 3¼ cents. per pound.

=A concern manufacturing fire-hose, garden hose, and bicycle-tires, is said to have leased a building in Beverly, Mass., for the manufacturing of these goods.

=During the past ten days the New York Belting and Packing Co. have taken orders for installing their interlocking rubber tiling on four steamers and one entire train of cars. The interlocking feature, by making it absolutely impossible to displace the tiling, peculiarly adapts it for use in all places where there is vibration, such as on steamers and railroad trains. On land, its durability, beauty and noiselessness recommend it for vestibules, aisles, corridors, hospitals, court rooms and numberless other places where such features are desirable.

=The third-quality shoes made by the United States Rubber Co. this year will be known as the "Columbia" brand, and the National India Rubber Co.'s factory will be a large producer.

=The New York headquarters of the Newton Rubber Works have been removed from No. 21 Park row to the adjoining building, No. 23.

=In Canada the rubber-shoe manufacturers have fixed their discounts the same as last year—25 and 5 per cent. off the list.

=The Enterprise Rubber Co., at their new store, No. 111 Reade street, New York, have their business arranged in three departments—"Candee" footwear, which they handle exclusively; mackintoshes and rubber clothing, in charge of C. H. Bishop, who was at the head of the late Sterling Rubber Co.; and the "Volt" and "Trim" tires, manufactured by the New Brunswick Tire Co. (New Brunswick, N. J.) for which the Enterprise company are selling-agents. The tire concern named occupies one of the two factories—the "old" one—of the New Brunswick Rubber Co., and is in charge of L. J. Phelps, general-manager, with S. K. Dingle, general sales-agent. These gentlemen will be remembered as composing the firm of Phelps & Dingle in the early history of the pneumatic tire.

=O. Bruckheimer, formerly with the Metropolitan Rubber Co., has joined the selling staff of the Enterprise Rubber Co. in New York.

=According to some figures recently published by Morgan & Wright (Chicago) they estimate an output this year of 1,300,000 pairs of tires, or enough for 650,000 bicycles. Since October 15 their factories had been running 24 hours a day, seven days in the week, and there were 1533 men on their pay-rolls. They claim to make 65 per cent. of all the pneumatic tires sold in the United States.

=The Apsley Rubber Co. (Hudson, Mass.) began on April 13 to run their plant on full time.

=The New York Belting and Packing Co., Limited, have recently increased the number of employés at their factory at Newtown, Conn., and also the wages of a number of those already on the pay-roll.

=It is rumored that the New Jersey Car Spring & Rubber Co., and the Eureka Fire Hose Co. have made an arrangement by which the entire line of fire and mill-hose manufactured by the latter company shall be marketed by the former company. That is the N. J. Car Spring Co. will be able to supply the trade at the same prices as do the Eureka Co. The rumor has a substantial foundation for the reason that these companies have been in the closest touch with each other for years and both are noted for the fine quality of the goods produced.

=It is said that George Watkinson & Co. (Philadelphia) will have their new factory in operation early in July next and will turn out 8000 pairs of rubber boots and shoes a day.

REVIEW OF THE INDIA-RUBBER MARKET.

THE tendency of crude-rubber prices during the past month has continued upward, although the majority of the manufacturers have been out of the market. According to the holders of rubber, here and elsewhere, it is purely a matter of consumption, the visible stocks being less now for several years past, although the Pará crop season just closing has yielded an unprecedented volume of rubber. Should the customary annual increase in the yield fail to be maintained next season, and particularly should the demand in the near future be larger than is at present apparent, a decidedly inconvenient situation—for somebody—might be developed. But the quotations for Pará grades published to-day, though justified by actual transactions in the market, are based upon very slight buying. No manufacturer is prepared to-day to buy beyond his immediate wants, preferring to run the risk of higher prices when they come to buy later, rather than to risk their money by investing it in rubber which may soon be worth less.

As for the shoe industry, it seems to be conceded that no such stock of last year's products is held to-day as to embarrass the manufacturers in planning another year's operations. The late snows effectually reduced stocks, particularly in retailers' hands. But the shoe factories are forced to go slow at the beginning of the season because of the necessity for waiting on the last-manufacturers for their supplies of narrow-toed styles.

The mechanical-goods people are not all of a class with respect to their activity. One large concern made more goods last year than in any former year, but says nothing about sales; another made the same quantity last year as in the year before, without increasing stocks; a third added to its working force and largely to its output, but is claimed to have stored a great deal of its product; another operator has been doing little business, the falling off making room for the increased trade of some other concerns, and so on. The same conditions apply this year—an average volume of trade, or even heavier, but

at prices too low to justify the buying of rubber as the market now rules.

"We have enough rubber in stock to make it unnecessary to buy a pound more before August," a leading manufacturer reports, "but our fine Pará was bought at 73 cents. We cannot pay 81 cents or higher without losing money on all the goods into which it enters. Nor can we afford to buy Assam at 57 cents. We simply will not push any lines of goods into which these rubbers enter, but will turn our energies to other branches of production."

The bicycle-tire manufacturers are too busy to know whether they are making money or not, and probably are doing more than anybody else to help the salesmen in crude rubber to earn their salaries.

The statistical position of Pará rubber in New York and elsewhere is as follows, the figures expressing tons of 1000 kilograms:

	Fine and Medium.	Coarse.	Totals.	Totals. 1895.	Totals. 1894.
Stock, March 31	311	77 =	388	627	1461
Arrivals, April	752	252 =	1004	905	974
Aggregating	1063	329 =	1392	1532	2435
Deliveries, April	824	236 =	1060	1070	970
Stock, April 30	239	93 =	332	462	1465

	1896.	1895.	1894.
Stock in England, April 30	1190	1396	1350
Deliveries in England, April	825	575	650
Pará receipts, April	1020	840	970
Stock in Pará, April 30	165	365	471
World's supply April 30 (excluding Caucho)	2693	3173	4372
Pará receipts since July 1	19,130	17,845	18,130

The latest quotations in the New York market are:

Pará, fine, new t a	80 @81	Congo Ball	@40
Pará, fine, old	86	Cameroon Ball	38 @39
Pará, coarse, new t a	46 @57	Flake, Ord and Lump	@25
Pará, coarse, old	60	Accra Flake	15 @18
Caucho (Peruvian) strip	@45	Lagos Strips	39
Caucho (Peruvian) ball	50 @51	Lagos Buttons	42
Mangabeira, sheet	@42	Liberian Flake	26 @27
Esmeralda, sausage	47 @	Madagascar pinky	53 @60
Guayaquil, strip	35 @41	Madagascar, black	@43
Nicaragua, scrap	45½@	Assam	42 @56
Nicaragua, sheet	none	Borneo	26 @40
Thimbles	34 @35	Gutta-percha, fine grade	1.30
Tongues	37½@38	Gutta-percha, medium	1.00
Sierra Leone	25 @52	Gutta-percha, hard white	85
Benguela	@47		

PRICES FOR APRIL (ISLAND RUBBER).

	1896. Fine.	1896. Coarse.	1895. Fine.	1895. Coarse.	1894. Fine.	1894. Coarse.
First	74	44	72	47	66	45
Highest	81	47	72	47½	65	45
Lowest	73½	44	71	46½	65	43½
Last	80	46½	72	47	66	43½

There have been developments in scrap rubber during the past month which suggested buying for speculation. It can hardly be said that there is a consumptive demand for this stock at a time when the shoe-factories are inactive and the mechanical-goods concerns are not rushed. Besides, the spring is the time for the coming forward of new collections, with the natural tendency of reducing prices. During the month transactions were reported at 4¾ cents, with 4⅞ @ 5 cents asked, for old rubbers in carload lots. At the same time consumers were offering 4.60 to 4.70 cents, and getting small lots, and they are now paying less. Late quotations are:

	Per Pound.
Old rubber boots and shoes, carloads	4.50@4.60
Do. smaller lots	4. @4.25
Rubber car springs	3. @3.37½
Mixed black scrap	per ton 14.00@15.00

In regard to the financial situation, Albert B. Beers, broker in India-rubber and commercial paper (No. 58 William street New York), advises us as follows:

"During the early part of the month of April the conditions of the money market, as regards commercial paper, were about the same as at my last report, there being but very little demand; but for the past ten days the demand has improved, money being easier, and rates have declined to about 5½ @ 6 per cent. for prime rubber paper, and 6 @ 7 per cent. for names not so well known."

IMPORTS FROM PARA.

THE receipts of India-rubber direct from Pará and Manáos at the port of New York since our last publication are reported in detail below, the figures referring to pounds:

April 11.—By the steamer *Hildebrand*, from Manáos and Pará:

	Fine.	Medium.	Coarse.	Caucho.	Total
New York Commercial Co.	385,300	62,500	79,300		=527,100
Reimers & Meyer	79,300	11,400	86,300	1,400	=178,400
Lawrence Johnson & Co.	55,300	15,400	21,500	10,700	=102,900
Shipton Green	21,000	2,400	9,000	2,100	= 34,500
Otto G. Mayer & Co.			14,200		= 14,200
P. Lima	4,800		5,500		= 10,300
George G. Cowl	1,400	700	1,000		= 3,100
Totals	547,100	92,400	216,800	14,200	=870,500

April 22.—By the steamer *Paraense*, from Pará:

New York Commercial Co.	97,400	26,700	53,500	26,000	=203,600
Reimers & Meyer	75,400	16,500	66,700	5,500	=164,100
Lawrence Johnson & Co.	24,300	3,600	23,300		= 51,200
Otto G. Mayer & Co.			12,000		= 12,000
P. Lima	5,700	300	5,200		= 11,200
Totals	202,800	47,100	160,700	31,500	= 442,100

May 1.—By the steamer *Sobralense*, from Manáos and Pará:

Charles Ahrenfeldt & Son.	2,600		94,600	207,300	=304,500
Lawrence Johnson & Co.	97,600	17,400	40,500	300	=155,800
New York Commercial Co.	41,000	7,500	23,700	7,100	= 69,300
Reimers & Meyer	49,600	3,900	14,400	900	= 68,800
Joseph Banigan		9,600	29,400		= 39,000
Shipton Green	15,400	2,500	4,100		= 22,000
P. Lima	5,100	1,100	6,000		= 12,200
George G. Cowl	3,900	700	400		= 5,000
Total	205,200	42,700	213,100	215,600	=676,600

	1896.	1895.
January Imports from Pará	2,718,300	2,869,500
February Imports	1,945 900	2,274,400
March Imports	2,786,300	3,611,700
April Imports	1,941,500	2,156,400

PARA IMPORTS VIA EUROPE.

April 1.—By the steamer *Majestic*, from Liverpool:

George A. Alden & Co. (Fine)	11,000
William A. Brown & Co. (Coarse)	10,000

April 4.—By the steamer *Lucania*, from Liverpool:

Reimers & Meyer (Fine)	20,000
Reimers & Meyer (Coarse)	20,000

April 9.—By the steamer *Germanic*, from Liverpool:

George A. Alden & Co. (Fine)	20,500

April 11.—By the steamer *Etruria*, from Liverpool:

Reimers & Meyer (Caucho)	7,500

April 11.—By the steamer *La Touraine*, from Havre:

Otto G. Mayer & Co. (Fine)	6,300

April 15.—By the steamer *Teutonic*, from Liverpool:

Albert T. Morse (Fine)	11,000

April 18.—By the steamer *Campania*, from Liverpool:

George A. Alden & Co. (Fine)	76,300
Reimers & Meyer (Fine)	45,000

April 26.—By the steamer *Umbria*, from Liverpool:

Reimers & Meyer (Fine)	57,000

April 29.—By the steamer *Majestic*, from Liverpool:

Albert T. Morse (Fine)	32,000

OTHER NEW YORK ARRIVALS.

BELOW will be found in detail the imports at New York during April, 1896, of India-rubber from Mexico, Central America, and South America, other than Pará grades; also, arrivals at New York of African and East Indian sorts:

CENTRALS.

	POUNDS.
APRIL 1.—By the *Finance*=Colon:	
W. R. Grace & Co	5,588
Isaac Brandon & Bro	2,553
Fred. Probst & Co	359
Total	8,500
APRIL 2.—By the *Yumuri*=Mexico:	
H. Marquardt & Co	1,000
Thebaud Bros	800
H. A. Forrest & Co	200
Total	2,000
APRIL 4.—By the *Lucania*=Liverpool:	
George A. Alden & Co	2,200
APRIL 7.—By the *Adirondack*=Greytown:	
Andreas & Co	10,000
A. P. Strout	2,000
Total	12,000
APRIL 7.—By the *Hudson*=New Orleans:	
Albert T. Morse	4,500
Francis H. Robinson	4,500
Total	9,000
APRIL 8.—By the *Orizaba*=Mexico:	
H. Marquardt & Co	1,000
Hughes & Co	800
Thebaud Brothers	200
Total	2,000
APRIL 9.—By the *Biela*=Bahia:	
Reimers & Meyer	4,000
New York Commercial Co	3,500
Total	7,500
APRIL 13.—By the *Alliance*=Colon:	
W. R. Grace & Co	5,200
Munoz & Esprielia	4,383
Roldan & Van Sickle	3,071
G. R. Cottrell & Co	1,515
A. Santos & Co	1,080
Flint, Eddy & Co	1,093
Dumarest & Co	1 027
G. Amsinck & Co	942
Lanman & Kemp	600
D. A. DeLima & Co	500
Maitland, Phelps & Co	400
Total	19,811
APRIL 14.—By the *Louisiana*=New Orleans:	
Francis H. Robinson	5,000
Albert T. Morse	4,500
Total	9,500
APRIL 14.—By the *Alleghany*=Cartagena:	
Punderford & Co	2,000
For London	2,000
G. Amsinck & Co	1 500
Kunhardt & Co	1,600
A. N. Rotholz	600
Total	7,100
APRIL 17.—By the *Carib*=Truxillo:	
Eggers & Heinlein	2 500
José Agostini	1,000
H. W. Peabody & Co	500
Total	4,000
APRIL 15.—By the *Kaffir Prince*=Bahia:	
Reimers & Meyer	5.500
APRIL 15.—By the *City of Washington*=Mexico:	
E. Steiger & Co	1,500
E. N. Tibbals	1,500
Thebaud Bros	600
H. A. Forrest & Co	500
J. W. Wilson & Co	400
Total	4,500
APRIL 21.—By the *Silvia*=Cape Gracias:	
Eggers & Heinlein	3,500
K. Mandell & Co	1,200
A. S. Lascelles & Co	600
For Liverpool	500
Total	5,800
APRIL 22.—By the *Seneca*=Mexico:	
J. W. Wilson & Co	1,50.
H. W. Peabody & Co	1,000
H. Marquardt & Co	1,000
Total	3,500
APRIL 22.—By the *El Sud*=New Orleans:	
Albert T. Morse	5,500
W. H. Grossman & Bro	2,500
Total	8,000
APRIL 23.—By the *El Dorado*=New Orleans:	
Albert T. Morse	6,000
APRIL 22.—By the *Advance*=Colon:	
Roldan & Van Sickle	10,216
Isaac Brandon & Bros	4,714
Dumarest & Co	2,922
A. Santos & Co	2,220
G. Amsinck & Co	2,408
Flint, Eddy & Co	2,000
J. M. Ceballos & Co	1,948
A. M. Capen Sons	1,721
A. P. Strout	1,500
J. Aparicio & Co	1,72
Maitland, Phelps & Co	1,000
Ellinger Brothers	1,005
Munoz & Esprielia	800
Ellmenhorst & Co	550
Total	35,600
APRIL 28.—By the *Alene*=Savanilla:	
For London	15,000
J. L. Phipps & Co	1,000
D. A. De Lima & Co	1,000
Kunhardt & Co	1,000
Ellinger Brothers	1,000
Punderford & Co	500
Total	20,000
APRIL 28.—By the *Yumuri*=Coatzacoalcos:	
Samuel Brothers	1,000
APRIL 29.—By the *Majestic*=Liverpool.	
Otto G. Mayer & Co	2,000
Total Centrals for April	175,511
Total for March	167,924
Total for February	297,764
Total for January	339,937

AFRICANS.

	POUNDS.
APRIL 1.—By the *Majestic*=Liverpool:	
George A. Alden & Co	10,200
Otto G. Mayer & Co	16,600
Total	26,800
APRIL 1.—By the *Edam*=Rotterdam:	
George A. Alden & Co	19,600
APRIL 4.—By the *Lucania*=Liverpool:	
Reimers & Meyer	59,000
George A. Alden & Co	2,300
For Boston	2,100
Total	63,400
APRIL 7.—By the *Mississippi*=London:	
Windmuller & Roelker	10,000
APRIL 7.—By the *Friesland*=Antwerp:	
Windmuller & Roelker	600
APRIL 8.—By the *Prussia*—Hamburg:	
Reimers & Meyer	42,000
George A. Alden & Co	5,600
Total	47,600
APRIL 11.—By the *Etruria*=Liverpool:	
George A. Alden & Co	74,000
Reimers & Meyer	70,500
New Jersey Car Spring and Rubber Co	1,800
Total	146,300
APRIL 15.—By the *Teutonic*=Liverpool:	
For Boston	1,000
APRIL 17.—By the *Persia*=Hamburg:	
George A. Alden & Co	41,000
Reimers & Meyer	23,000
Total	64,000
APRIL 18.—By the *Campania*=Liverpool:	
Reimers & Meyer	16,000
For Boston	7,800
Total	23,800
APRIL 26.—By the *Umbria*=Liverpool:	
George A. Alden & Co	29,000
Reimers & Meyer	3,000
Total	32,000
APRIL 28.—By the *Nomadic*=Liverpool:	
George A. Alden & Co	22,500
APRIL 29.—By the *Majestic*=Liverpool:	
Otto G. Mayer & Co	22,000
William A. Brown & Co	10,000
Total	32,000
Total Africans for April	315,300
Total for March	775,100
Total for February	316,300
Total for January	424,900

EAST INDIAN.

	POUNDS.
APRIL 8.—By the *Cufic*=Liverpool:	
Reimers & Meyer	2,000
APRIL 13.—By the *Albano*=Havre:	
Otto G. Mayer & Co	7,500
APRIL 14.—By the *Hindoo*=London:	
George A. Alden & Co—(Pontianak)	202,200
Windmuller & Roelker—(Pontianak)	63,600
Windmuller & Roelker	8,000
Robert Soltan & Co	11,100
Total	285,300
APRIL 20.—By the *Cevic*=Liverpool:	
George A. Alden & Co	5,500
APRIL 22.—By the *Port Adelaide*=Singapore:	
George A. Alden & Co (Pontianak)	112,000
Robert Soltan & Co	32,400
Windmuller & Roelker	10,100
Total	154,500
APRIL 28.—By the *Massachusetts*=London:	
Windmuller & Roelker—(Pontianak)	67,000
Total East Indian for April	522,400
Total for March	310,100
Total for February	265,600
Total for January	315,400

RECAPITULATION.

	POUNDS.
Pará—direct imports	1,941,500
Pará—via Europe	316,600
Centrals	175,511
Africans	315,300
East Indian	522,400
Total at New York for April	3 271,311
Total for March	4,192,224
Total for February	2,840,862
Total for January	2,823,537

BOSTON ARRIVALS.

	POUNDS.
APRIL 1.—By the *Sagamore*=London:	
George A. Alden & Co.—Africans	19,240
George A. Alden & Co.—Pará	22,650
Sgal & Co.—Pará	7,700
APRIL 1.—By the *Scythia*=London:	
Sgal & Co.—Pará	16,000
APRIL 1.—By the *Baltimore*=London:	
George A. Alden & Co.—East India	2,690
APRIL 7.—By the *Cambroman*=Liverpool:	
George A. Alden & Co.—Africans	9,900
Sgal & Co.—Africans	2,000
APRIL 12.—By the *Catalonia*=Liverpool:	
Reimers & Meyer—Africans	2,000
APRIL 18.—By the *Virginian*=London:	
George A. Alden & Co.—Africans	1,970
APRIL 22.—By the *Michigan*=Liverpool:	
Reimers & Meyer—Africans	16,600
Sgal & Co.—Africans	5,000
APRIL 28.—By the *Sachem*=Liverpool:	
Reimers & Meyer—Africans	5,000
George A. Alden & Co.—Africans	11,900
Total at Boston for April	122,050
Total for March	209,601
Total for February	210,000
Total for January	72,800

NEW ORLEANS.

APRIL.

	POUNDS.	VALUE.
From Nicaragua	20,963	$8,033

United States Rubber Company.

NEW BRUNSWICK, N. J., April 16, 1896.

The annual meeting of the stockholders of the United States Rubber Company for the election of Directors, and for the transaction of any other business which may properly be brought before it, will be held at the office of the company in New Brunswick, N. J., on Tuesday, May 19, 1896, at 12 o'clock M.

The transfer books will be closed at the close of business Saturday, April 25, 1896, and will reopen May 20, 1896.

By order of the Executive Committee.

CHARLES L. JOHNSON, Sec'y.

Free Want Department.

AN ENERGETIC SALESMAN, 26 years of age seeks employment in rubber store; experienced in garment department; highest testimonial from a first-class firm. Address WATERPROOF, care of INDIA RUBBER WORLD. (May.)

A YOUNG MAN, experienced in selling bicycle tires, desires a position with some good house manufacturing a line of these goods. Address CHANDLER, care of INDIA RUBBER WORLD. (May.)

FOR SALE.—Vulcanizer 4'×25' with carriage, rails, and asbestos covering, cheap. Address SNED, care of INDIA RUBBER WORLD. (May.)

WANTED.—A man who thoroughly understands the manufacture of reclaimed rubber both mechanical and chemical. Address No. 80, care of INDIA RUBBER WORLD.

WANTED.—One steam vulcanizer, 12 ft. × 36 in. Address, giving full particulars and price. Tire, care of INDIA RUBBER WORLD. (May.)

HARD RUBBER (ebonite) or general rubber goods.—Advertiser is shortly commencing business in London and is prepared to stock and push first class manufacturers goods; has extensive British connection and excellent references. Address M. Maclean, Lorne House, Hornsey, London. (May.)

WANTED.—Salesman with 10 years experience desires a line of rubber boots and shoes, mackintoshes and rubber clothing to sell on commission in Virginia; three years with the Colchester Rubber Co. I will consider an offer on novelties. Best of reference and bond if required. Address W. S. Buchanan, Oakland P. O., Louisa Co., Virginia. (May.)

CHEMIST, American, with German diploma desires position in rubber factory; is at present superintendent of similar establishment in Germany. Address C. Allen, 120 E. 86th st., New York. (May.)

WANTED.—Superintendent for mechanical rubber goods factory in the Middle States. Address MIDDLE, care of INDIA RUBBER WORLD. (May.)

WANTED.—A line of rubber goods or mechanical specialties for the markets of France, Belgium and Switzerland. The advertiser has had eleven years experience in those lines and has an established trade. The best of references given. Address, FRANCE, care of INDIA RUBBER WORLD. (May.)

WANTED.—By a young man with over six years' experience in large rubber house, a position as salesman. References A 1. Address, Mortimer, care of S. Emberson, 59 West 42d St., New York City. (April.)

WANTED.—A New York house holding the agency for a popular wheel in New England and the Middle States would like a full line of bicycle sundries to sell to trade already established by them. Address, N. Y., care of INDIA RUBBER WORLD. (April.)

FOR SALE.—Moulds, dies, tools, patterns, electrotypes, etc., of a druggists' sundries plant, all in first-class order. Address, C. B. D., 830 President St., Brooklyn. (April.)

A MAN experienced in the manufacture and sale of vulcanite and chemical emery wheels desires a permanent situation. Address, VULCANITE, care of INDIA RUBBER WORLD. (April.)

WANTED.—A 50-foot hose machine in good order. Address at once, stating price. F. W. H., INDIA RUBBER WORLD office. (April.)

A YOUNG MAN experienced in the manufacture of all kinds of hose desires a position as foreman; is also a perforated mat cutter and designer. Address, E. X., INDIA RUBBER WORLD office. (April.)

WANTED.—A man experienced in the manufacture of tires. Address, BICYCLE, care of INDIA RUBBER WORLD. (April.)

Important Sale of Manufacturing Property at Public Auction

By Order of the Owner.

On the Premises 144 to 154 Provost St., Jersey City, N. J.,

Wednesday, June 3d, 1896, at 11 o'clock, a. m.

Ground Lease, Buildings, Entire Plant, Machinery, Tools, Fixtures, &c.

OF THE

Rubber Works of LOEWENTHAL & MORGANSTERN.

The plant has all modern factory improvements; it has been in operation for a number of years for the manufacture of reclaimed rubber, with a daily product of about ten tons. Excellent railroad facilities. Brick buildings 1, 2 and 3 stories of about 30,000 square feet floor space. About 450 horse power boiler capacity, and about 300 horse power engines. Electric Light plant and Sprinkler system. Annual ground rent $1075; lease expires 1901, but carries an option of the buyer for ten years' renewal. The plant affords an excellent opportunity for the manufacture of bicycle tires, mechanical or surgical rubber goods, etc. Some Rubber Company not now making their own reclaimed rubber can procure a complete outfit.

This property will be sold in one lot as a whole, subject to ground rental and taxes; or the buildings with steam motor plant, electric light plant and sprinkler system (without the machinery) in one lot, subject to ground rental and taxes; and the machinery, fixtures, etc., in separate lot or lots, as may be considered advisable at time of sale.

If sold in one lot, part of the purchase money can, at the option of the buyer, remain on Bond and Mortgage.

For full particulars or permit to inspect the property, apply to

E. DE FOREST SHELTON,

Specialist in Manufacturing Properties,

OFFICE, STEWART BUILDING, 280 Broadway, New York City.

Mention The India Rubber World when you write.

Bi-Sulphide of Carbon. CHLORIDE OF SULPHUR. ALGANNIN PASTE. Specially prepared for Vulcanizing India Rubber. Samples and Quotations on application.

EDWARD R. TAYLOR, Manufacturer, CLEVELAND, O.

Mention the India Rubber World when you write. Correspondence Solicited

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